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The OIL WELL DRILLER

HISTORY OF The OIL INDUSTRY Of the WORLD

WHITESHOT

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I am dear Reader,
Yours Very Truly,
Charles Austin Whiteshot

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THE OIL-WELL DRILLER

A HISTORY OF
THE WORLD'S GREATEST ENTERPRISE,
THE OIL INDUSTRY

BY
CHARLES A. WHITESHOT
Author of "The History of Oil and Gas," "Oil Sketches,"
"Oil Notes," etc.



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CHARLES AUSTIN WHITESHOT
MANNINGTON, WEST VIRGINIA
1905

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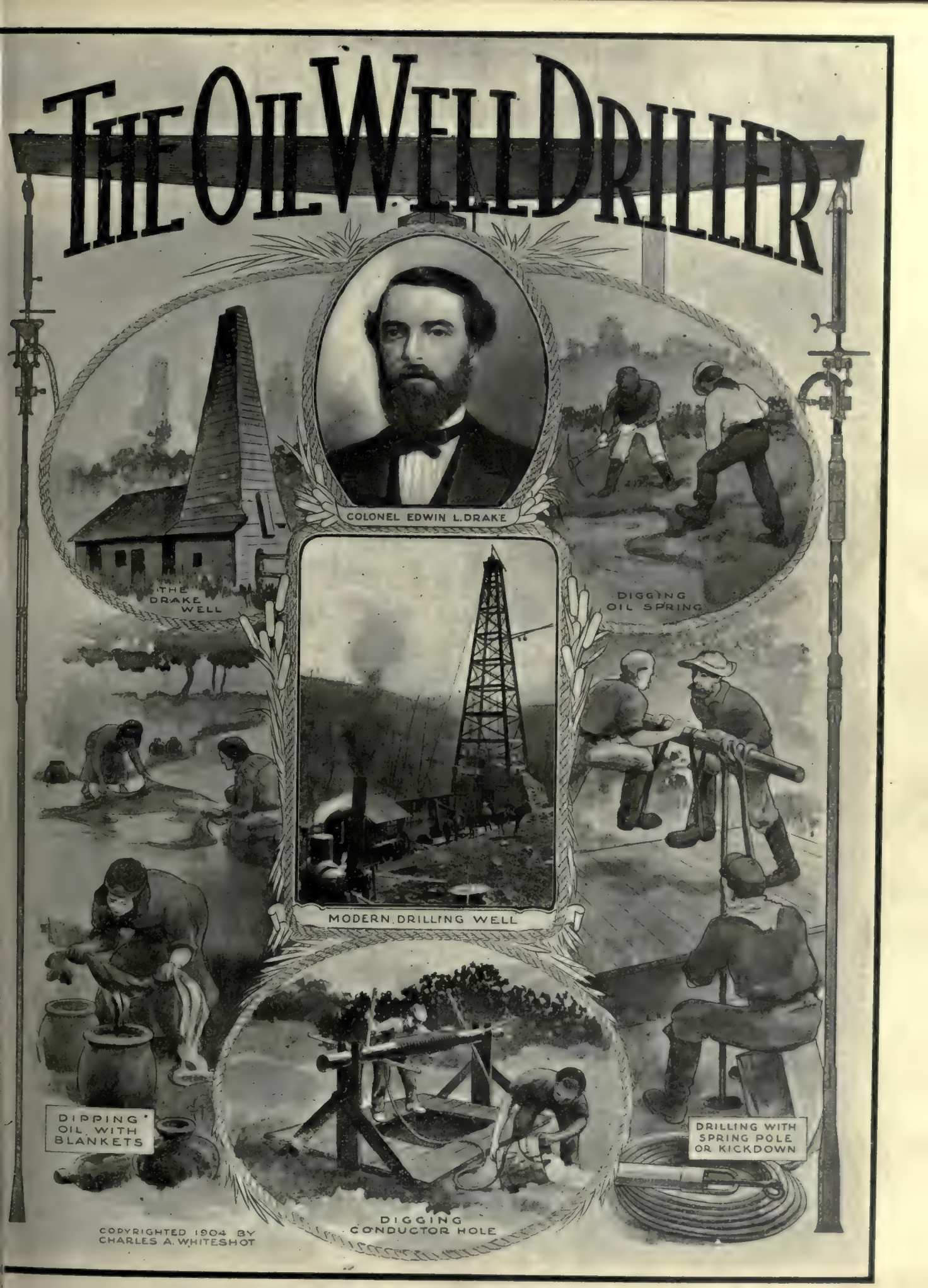
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THE OIL-WELL DRILLER

THE UNIVERSALLY
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WORLD'S HISTORY OF
PETORLEUM, CRUDE AND REFINED OIL,
NATURAL GAS, CARBON BLACK
AND ITS BY-PRODUCTS.

THROUGHOUT OILDOM
WITH PEN AND CAMERA FOR TRUTH AND JUSTICE,
I AM, DEAR READER, YOURS VERY TRULY,

CHARLES AUSTIN WHITESHOT.


GAS WELL AT NIGHT
FLOWING OIL WELL
JARVIS ENG CO.
UNCLE SAM LIGHTING THE WORLD WITH AMERICAN OIL
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AUTHOR'S PREFACE

Second Edition of The Oil Well Driller History of the Oil Industry of the World.

This title is selected owing to the fact that the driller is the man in charge of the well when it is drilled into the sand or lime strata, which is the true source of petroleum—crude oil, and the first man to receive the true history and record of all wells drilled in the world.

While it may seem to the uninitiated a task involving but little difficulty to prepare for publication the true history of the oil, natural gas, carbon black and the by-products of the world, it is not out of place here to assure all such readers that this work is one demanding a vast amount of labor and research, watchful care, untiring patience and great discrimination. This need not be said to any person who has had experience in similar work in attempting the production of a true history of petroleum. I did not underestimate the difficulties of the task, and came to it fully imbued with a clear idea of its magnitude, and a determination to execute it in such a manner that it should receive the commendation of all into whose hands it should fall.

I was born and resided in the oil regions, and for twenty-five years was employed in the several departments connected with the oil industry. The past five years have been consumed in visiting every oil and gas field, pipe lines and stations, oil refineries and carbon black factories in person in the United States, Canada and Mexico, which required twenty-five thousand miles of travel, ten thousand people were interviewed, two thousand letters were exchanged in correspondence, and a cost of twenty thousand dollars was required to publish the first and second editions. While a perfect historical work, unprejudiced and unbiased, of the world's greatest enterprise, the oil and gas industry, has never before been published, this one can be relied upon to be true in every sense of the word, and is the recognized authority on all matters pertaining to the history of oil, natural gas, carbon black and its by-products.

Those who have aided this work with statistical reports, information and interviews are the—

Standard Oil and affiliated companies.
Pure Oil Company.
John W. Steel (Coal Oil Johnny).
Lewis Emery, Jr., Manufacturing Co.
National Transit Company.
Tidewater Pipe Line Company.
United States Pipe Line Company.
Producers and Refiners Pipe Line Co.
Whiting, Vacuum.
Camden Consolidated, Bayonne.
Chas. Pratt & Co., Acme.
Thompson & Bedford, Atlantic.
Eclipse and Galena-Signal.
Standard Oil refineries.
Tidewater refinery, Bayonne, New Jersey.
Pure Oil refinery, Marcus Hook, Pa.
Lewis Emery, jr., producer and refiner, Bradford, Pa.
Cornplanter, Seneca and United refineries, Warren. Pa.
Oil Well Supply Company, Pittsburg, Pa.
J. M. Guffey Petroleum Co., of Texas.
Pacific Coast Oil Co., of California.
Philadelphia Natural Gas Co.
Burt Oil Company.

American Cordage Co.
Columbia Cordage Co.
A. Knabb & Co., manufacturers of oil barrels, Warren, Pa.
Carnegie Natural Gas Co.
Hope Reserve and Connecting Gas Co.
Union Gas Corporation.
Oil City Fuel Supply Co.
Pennsylvania Gas Co.
United Natural Gas Co.
Manufacturers Light and Heat Co.
Ohio Fuel Supply Co.
Northwestern Ohio Gas Co.
Tripple State Natural Co.
Colonel James M. Guffey, Pittsburg, Pa.
Thomas W. Phillips, New Castle, Pa.
United States Senators S. B. Elkins and N. B. Scott, West Virginia.
B. B. Dovener, Congressman, Wheeling, W. Va.
Honorable Leslie M. Shaw, Secretary of the Treasury of the United States.
Honorable Charles D. Walcott, Director of the Department of the Interior of the United States Geological Survey.
Honorable William R. Merriam, Director of the Census of the United States.
Honorable S. P. Langley, Secretary of the Smithsonian Institute of the United States.
West Virginia Historical Society.
Astor Public Library, New York.
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Warren Weekly Mail, Warren, Pa.
Oil City Derrick, Oil City, Pa.
Bion H. Butler, editor on the staff of the Pittsburg Times, Pittsburg, Pa.
Walter B. Brooks, executor of the estate of Dr. J. P. Hale, Charleston, W. Va.
C. H. Shattuck, Parkersburg, W. Va.

Foreign oil and gas statistics were received through the kindness of—

Sir Michael H. Herbert, late British Ambassador.
Comte Cassini, Russian Ambassador.
Herr Von Holleben, German Ambassador.
M. Jusserand, French Ambassador.
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Colonel J. C. Rathbone, Parkersburg, W. Va.
Honorable Willis B. Benedict, Titusville, Pa.
British-American Petroleum Co., Yenangyat, Upper Burmah, India.
Royal Dutch Petroleum Co., Singapore, Sumatra.
Nobel Brothers, Baku, Russia.

And thousands of others, and to all those the author extends his grateful thanks.

Yours very truly,

CHARLES AUSTIN WHITESHOT.

TO THE PUBLIC IN GENERAL AND THE READER IN PARTICULAR.

In bygone years several persons unfamiliar with the oil industry, not having been directly interested or employed therein, and a great number of them who had not seen an oil or natural gas well in operation prided themselves upon being authorities and authentic writers of oil history. It was those exaggerated and misrepresented stories that led the writer to take up the task of writing an oil and natural gas history of the world's greatest industry, being a practical oil man and having had a number of years of actual experience in the oil business. In the year 1900 I laid aside the editorial pen on The Oil Region News and at once began the labor of gathering pictures covering the entire period of the oil industry from its beginning, and the compiling of a true and full history of the oil industry, over five years being consumed in my travels, visiting every oil and natural gas field of note, the oil refineries, pipe line systems, shipping points and offices in the United States, Canada and Mexico. While the writer of this history is not associated with any company or individual in this work, and is free to use his own judgment regarding what is true and what is not true in oil history, he does not take issue with any company or individual interested in the oil and natural gas industry, but he does take exception to a great number of newspaper articles which greatly misrepresent the true state of the oil industry. One in particular, which claims to be a history of the Standard Oil Company, the main part of the so-called history was taken from the Congressional Record from the evidence given before the Industrial Commission appointed by Congress to investigate the methods of the Standard Oil trust. The writer for the magazine very cleverly avoided giving all the evidence on both sides of the question at trial, and intentionally avoided giving a true and full report of the proceedings of the committee, and only permitted that part that was against the Standard Oil Company, which led the readers of the article to form an opinion of the case without giving the evidence in full on both sides of the trial. The reader will find every word of evidence given before this commission in the rise and history of the Standard Oil Company in this history. The writer has interviewed all of the leading shareholders and officials of the Standard Oil Company and affiliated companies from the general officials to the officials in the fields, beginning with John D. Rockefeller and the Standard's army of assistants; and to these men the writer is under deep obligations for courteous treatment received in securing information and statistics, from the officials in the general office at 26 Broadway, New York; the district officials, the refiners, pipe line officials, and the men in the fields. This is truly an American company of American men, who are advancing millions of dollars each year in establishing markets in all parts of the world for American oil, and it can truthfully be said the sun never sets on the supply and demand of American oil. The writer feels under deep obligations to Senator Lewis Emery, jr., and a great army of independent oil producers for favors and kind treatment in the way of information and records, and to all those he extends his grateful thanks.

CHARLES A. WHITESHOT.


MANNINGTON, WEST VA.
CENTER OF THE
MANNINGTON OIL FIELD.

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History of the Oil Industry of the World

CRUDE OIL.

Petroleum (from Petra, a rock) and Oleum (oil or rock—oil), a natural product of the earth oozing from below the surface and flowing with the gas. Petroleum is not of constant composition, but is a variable mixture of animal, marine, mineral and vegetable liquid hydro (carbons), and varies in color from light lemon to dark green and black.

EARLY HISTORY OF PETROLEUM—PETROLEUM SPRINGS.

While the history of petroleum in America prior to developments brought about by artesian drilling will probably be accounted of little practical value, it is apprehended that a work of this sort overlooking it would be incomplete.

In Europe and Asia it has been an object of some commercial value for centuries, and there is good reason to believe that it has been known and used since the earliest ages of the world.

It is impossible to go back to the time when petroleum was first discovered. From its frequent occurrence in the form of springs in many parts of the world, it is evident that it has always been known—certainly more than four thousand years.

Layard and Botta, in their discoveries at Ninevah, adduce positive evidence that the inhabitants of this ancient city had knowledge of the existence and use of petroleum. In building the city, an asphaltic mortar ("slime," according to the Old Testament), was employed, the asphalt for which was a partially evaporated petroleum. That used at Babylon was obtained from the Springs of Is, on the Euphrates, which, at a later date, attracted the attention of Alexander, of Trajan, and of Julian; they, even to this day, supply the neighboring villages with oil.

Herodotus, 500 years before Christ, spoke of the oil wells of Zante; and Pliny and Dioscorides described the oil of Agrigentum, which was used in lamps under the name of "Sicilian Oil."

The wells of Amiano, on the banks of the Taro, were formerly used for lighting the City of Genoa.

The earliest history of the discovery of petroleum (Crude oil) in America was made by the "Seneca Indians," one of the clans of the five nations called by the French "Hiro Couis," the men of the five nations (afterwards the six nations) and later called Iroquois by the English. The Indians of the six nations called themselves "Hedonosaunee," which means literally they form a cabin or wigwam. To this day the name Iroquois is the name applied to the six nations or tribes of Indians known as Mohawks, Oneidas, Senecas, Onondagas, Cayugas and Tuscaroras. Those tribes or clans of Indians when first discovered by white men inhabited what is now known as Central and Western New York and Northwestern Pennsylvania.

When the five nations were first visited by Europeans the Senecas chiefly dwelt among the hills south of the Cayuga and Seneca Lakes in New York and along the Genesee river, though at the same time they had villages on the upper waters of "Alegina," meaning clear water and known as the Allegheny river, and the west branch of the Susquehanna rivers in Pennsylvania. Thus they guarded a line extending from Lake Ontario to the navigable waters of the Allegheny. They called themselves Nuduwawgah, or the men of the hills, and had many traditions in regard to the discovery of the fire water springs, meaning the oil springs, the location of which they guarded as a secret for a great number of years.

The nation of Indians on the south of the Senecas were the Mingos, and on the north and northwest were two strong tribes or nations known as the Errieronons Erie or Cat Nation, and the Andestiquerons or Kahquah Nations, class of the Hurons. Like other Indian tribes, the Kahquahs guarded against surprise by placing their villages a short distance back from any navigable water. In this case from the Niagara river and Lake Erie one of those villages was named Onquiaahro, after the mighty torrent which they designated by that name—a name which has since been shortened and transformed into Niagara. In dress, food and customs the Kahquahs do not appear to have differed, much from the other savages around them, wearing the same scanty covering of skins, living chiefly on meat killed in the chase, but raising patches of Indian corn, beans and gourds.

Such were the inhabitants of a region which was then crossed by no imaginary lines of latitude or longitude, state, county, township, or district, and such were their surroundings when first visited by the French in 1604. At this early date and perhaps centuries before wild game was very plentiful and buffaloes roamed in the forests and on the shores of a large body of fresh water which is now known to every American as Lake Erie. Through the jealousies of conquest the Eries became the deadly enemies of the Iroquois, while the Kahquahs remained neutral and neighbored a great deal with the Senecas, the largest tribe of the Iroquois inviting them to visit their hunting grounds and kill all the buffaloes they wished. At this date the Senecas held an annual feast on or about full moon in August of each year. In later years the white men named the Indian feast week the Indian Corn Dance, which is celebrated each year to this date.

It was at one of those early feast gatherings or dances that the Senecas first introduced the fire dance

her friends, related that the party stopped several days at a salt spring on the Kanawha river, rested from their weary march, killed plenty of game and feasted themselves on the fat of the land; in the meantime, boiling salt water and making a supply of salt, which was carefully packed and taken with them to their western homes. This is not only the first account we have of salt making on Kanawha, but anywhere else west of the Alleghanies. In fact, if there is any earlier record of salt-making from brine springs, anywhere in the United States, I am not aware of it.

The earliest settlement made by whites, in the Kanawha Valley, was by Walter Kelley and family, at the mouth of the creek which bears his name, in the spring of 1774, several months before the battle of Point Pleasant, where the combined Indian tribes, under the celebrated Sachem, Cornstalk, were defeated and driven back by the Virginians, under General Lewis.

Kelley and his family paid the forfeit of their lives for their temerity; they were all killed by the Indians; but after the battle of the Point, when there was greater security for life, the valley was rapidly settled, mostly by Virginians, and in a great part by the hardy soldiers who had followed Lewis to Point Pleasant.

The early pioneer settlers, in a wilderness, without communication with other settlements, except by foot or bridle paths, depended upon the Kanawha Licks for their scanty supply of salt. In those days of simple economy and provident thrift, when everything useful was made the most of, the women's wash-kettles were put under requisition for a fourfold duty; they boiled the daily hog and hominy, and other wholesome, frugal fare; once a week they boiled the clothes, on wash day; semi-occasionally they boiled the salt water for a little of the precious salt, and every spring they went to the sugar camp, to boil the annual supply of maple sugar and molasses.

It is related that at one time, when there was an apprehended attack from the Indians, the few early settlers were posted at the mouth of Coal river, for protection. Being out of salt and suffering for the want of it, they sent some of their hardy and daring young men in canoes up to the salt spring, where they dipped the canoes full of salt water; and, getting safely back, the water was boiled, and the precious salt made under cover of the fort.

Among the earliest land locations made in the valley, was one of 502 acres, made in 1785, by John Dickinson, from the Valley of Virginia, to include the mouth of Campbell's creek, the bottom above and the salt spring. Dickinson did not improve or work the property himself, but meeting with Joseph Ruffner, an enterprising farmer from the Shenandoah Valley, Virginia, in 1794, and describing his salt spring to him, Ruffner became so impressed with its value that he then and there purchased the 502 acres upon Dickinson's own report, without himself seeing it, agreeing to pay for it 500 pounds sterling without condition, and other sums conditioned upon the quantity of salt to be made, which might increase the price to 10,000 pounds sterling. Having gone thus far, he sold out his Shenandoah estates, and in 1795 removed himself and family to Kanawha to look after his salt property. Upon arriving there, however, his penchant for rich farming lands overcame him, and he purchased, from George and William Clendenen, the large river bottom of 900 acres extending from the mouth of Elk river up Kanawha; and, upon 40 acres of which the village of Charleston had been laid out and started the previous year. This last purchase, and the subsequent attention to clearing and improving the farm, diverted Ruffner's attention for a time, from the salt project; the delay was fatal so far as he was concerned; he did not live to execute his pet scheme or realize his cherished hopes. Dying in 1803, he willed the property to his sons, David and Joseph, enjoining it upon them to carry out, as speedily as practicable, his plans of building up extensive sale manufactories to supply not only the increasing local demand, but a larger and still more rapidly growing demand which was now coming from the many thrifty settlements throughout the Ohio Valley. During the elder Ruffner's life, however, he had leased to one Elisha Brooks the use of salt water and the right to manufacture salt; and in 1797 this Elisha Brooks erected the first salt furnace in Kanawha or in the western country. It consisted of two dozen small kettles set in a double row, with a flue beneath, a chimney at one end, and a fire bed at the other.

To obtain a supply of salt water he sank two or three "gums," some 8 or 10 feet each in length, into the mire and quicksand of the salt lick, and dipped the brine with a bucket and swape, as it oozed and seeped in through the sands below.

In this crude, rough-and-ready way, Brooks managed to make about 150 pounds of salt per day, which he sold at the kettles, at 8 and 10 cents per pound. No means were used to settle or purify the brines or salt, as the salt water same from the gum, so it was boiled down to salt in the kettles, with whatever impurities or coloring matter it contained. As it issues from the earth it holds some carbonate of iron in solution; when it is boiled, this iron becomes oxidized, and gives a reddish tinge to the brine and salt.

This Kanawha salt soon acquired a reputation for its strong, pungent taste, and its superior qualities for curing meat, butter, etc. A great many who used it and recognized these qualities in connection with its striking reddish color came to associate the two in their minds in the relation of cause and effect, and orders used to come from far and near for some of "that strong red salt from the Kanawha Licks."

Almost the only mode of transporting salt beyond the neighborhood, in those early days, was by packhorses, on the primitive, backwoods pack-saddle. So much of this was done, and so familiar did the public mind become with the term, as used in that sense, that even to this day, among a large class of people, the verb "to pack" is always used instead of other synonymous or similar terms, such as carry, transport, fetch, bring, take, etc., and the "tote" of Old Virginia.

It was not until 1806 that the brothers, David and Joseph Ruffner, set to work to ascertain the source of salt water, to procure, if possible, a larger supply and of better quality, and to prepare to manufacture salt on a scale commensurate with the growing wants of the country.

The Salt Lick, or "The Great Buffalo Lick," as it was called, was just at the river's edge, 12 or 14 rods in extent, on the north side, a few hundred yards

above the mouth of Campbell's creek, and just in front of what is now known as the "Thoroughfare Gap," through which, from the north, as well as up and down the river, the buffalo, elk, and other ruminating animals made their way in vast numbers to the lick. I may mention *en passant* that so great was the fame of this lick, and the herds of game that frequented it, that the great hunter, explorer, and conqueror of the "bloody ground" of Kentucky, Daniel Boone, was tempted here, made a log cabin settlement, and lived just on the opposite side of the river, on what is now known as the Donnally farm or splint coal bottom. I have had, from old Mr. Paddy Huddlestone, who died a few years ago, at nearly one hundred years of age, many interesting anecdotes of their joint adventures in hunting and trapping. Boone still lived there in 1789-90, when Kanawha county was formed, and in 1791 served as one of the delegates for the county in the Legislature at Richmond.

But to return to the Lick, and the operations of the Ruffner brothers. In order to reach, if possible, the bottom of the mire and oozy quicksand through which the salt water flowed, they provided a straight, well-formed, hollow sycamore tree, with four feet internal diameter, sawed off square at each end. This is technically called a "gum." This gum was set upright on the spot selected for sinking, the large end down, and held in its perpendicular position by props or braces, on the four sides. A platform, upon which two men could stand, was fixed about the top; then a swape erected, having its fulcrum in a forked post set in the ground close by. A large bucket, made from half of a whisky barrel, was attached to the end of the swape, by a rope, and a rope attached to the end of the pole to pull down on, to raise the bucket. With one man inside the gum, armed with pick, shovel and crowbar, two men on the platform on top to empty and return the bucket, and three or four to work the swape, the crew and outfit were complete.

After many unexpected difficulties and delays, the gum, at last, reached what seemed to be rock bottom at 13 feet; upon cutting it with picks and crowbars, however, it proved to be but a shale or crust, about six inches thick, of conglomerated sand, gravel and iron. Upon breaking through this crust the water flowed up into the gum more freely than ever, but less salt.

Discouraged at this result, the Ruffner brothers determined to abandon this gum, and sink a well out in the bottom, about 100 yards from the river. This was done, encountering, as before, many difficulties and delays; when they had gotten through 45 feet of alluvial deposit, they came to the same bed of sand and gravel upon which they had started, at the river.

To penetrate this, they made a 3½-inch tube of a 20-foot oak log, by boring through it with a long shanked augur. This tube, sharpened, and shod with iron at the bottom, was driven down, pile-driver fashion, through the sand to the solid rock. Through this tube they then let down a glass vial with a string to catch the salt water for testing.

They were again doomed to disappointment; the water, though slightly brackish, was less salt than that at the river. They now decided to return to the gum at the river, and, if possible, put it down to the bed rock. This they finally succeeded in doing, finding the rock at 16 to 17 feet from the surface.

As the bottom of the gum was square, and the surface of the rock uneven, the rush of outside water into the gum was very troublesome. By dint of cutting and trimming from one side and the other, however, they were, at last, gotten nearly to a joint, after which they resorted to thin wedges, which were driven here and there as they would "do the most good."

By this means the gum was gotten sufficiently tight to be so bailed out as to determine whether the salt water came up through the rock. This turned out to be the case. The quantity welling up through the rock was extremely small, but the strength was greater than any yet gotten, and this was encouraging. They were anxious to follow it down, but how? They could not blast a hole down there, under water; but this idea occurred to them; they knew that rock blasters drilled their powder holes two or three feet deep, and they concluded they could, with a longer and larger drill, bore a correspondingly deeper and larger hole.

They fixed a long iron drill, with a 2½-inch chisel bit of steel, and attached the upper end to a spring pole, with a rope. In this way the boring went on slowly and tediously till on the 1st of November, 1807, at 17 feet in the rock, a cavity or fissure was struck, which gave an increased flow of stronger brine. This gave new encouragement to bore still further; and so, by welding increasing strength of shaft to the drill, from time to time, the hole was carried down to 28 feet, where a still larger and stronger supply of salt water was gotten.

Having now sufficient salt water to justify it, they decided, and commenced, to build a salt furnace; but while building, continued the boring, and on the 15th day of January, 1808, at 40 feet in the rock, and 58 feet from the top of the gum, were rewarded by an ample flow of strong brine for their furnace and ceased boring.

Now was presented another difficulty: how to get the stronger brine from the bottom of the well, undiluted by the weaker brines and fresh water from above; there was no precedent here; they had to invent, contrive, and construct anew. A metal tube would naturally suggest itself to them; but there were neither metal tubes, nor sheet metal, nor metal workers—save a home-made blacksmith—in all this region, and to bore a wooden tube 40 feet long, and small enough in external diameter to go in the 2½-inch hole, was impracticable; what they did do, was to whittle out of two long strips of wood, two long half tubes of the proper size, and, fitting the edges carefully together, wrapped the whole from end to end, to fit, as nearly as practicable, water tight, in the 2½-inch hole, and was cautiously pressed down to its place, and found to answer the purpose perfectly; the brine flowed up freely through the tube into the gum, which was now provided with a water tight floor or bottom, to hold it; and from which it was raised by the simple swape and bucket.

Thus was bored and tubed, rigged and worked, the first rock-salt well west of the Alleghanies, if not in the United States. The wonder is not that it required eighteen months or more to prepare, bore and com-

plete this well for use, but, rather, that it was accomplished at all under the circumstances. In these times, when such a work can be accomplished in as many days as it then required months, it is difficult to appreciate the difficulties, doubts, delays, and general troubles that beset them then. Without preliminary study, previous experience or training, without precedents in what they undertook, in a newly settled country, wtihout steam power, machine shops, skilled mechanics, suitable tools or materials, failure, rather than success, might reasonably have been predicted.

The new furnace, which for some time had been under construction, was now complete. It was simply a reproduction of the Elisha Brooks' kettle furnace, on a larger scale. There were more kettles, of larger size, and better arranged.

On the 8th of February, 1808, the Ruffner Bros. made their first lifting of salt from this furnace, and simultaneously reduced the price to the then unprecedently low figure of 4 cents per pound.

From this time forward, salt-making, as one of the leading industries of Kanawha, was an established fact, and Kanawha salt one of the leading commercial articles of the west; and wherever it has gone, from the Alleghanies to the Rocky mountains, from the Lake to the Gulf, its superior qualities have been recognized and appreciated.

The neighboring property owners, who had watched the progress and result of the Ruffner well with such deep interest, now instituted borings on their own lands, above and below, and on both sides of the river. Among these earlier, enterprising experimenters were William Whitaker, Tobias Ruffner, Andrew Donally, and others. All were more or less successful in getting a supply of brine, at depths varying from 50 to 100 feet, and by 1817 there were some 30 furnaces and 15 or 20 wells in operation, making in the aggregate 600,000 to 700,000 bushels of salt.

In this year an important revolution in the manufacture of salt was effected by the discovery of coal. Although, in one of the finest coal fields of the world, coal had not, hitherto, been found here in workable seams, nor been used at all, except for blacksmith purposes. Wood had been the only fuel used in salt-making, and for other purposes, and all the bottoms and convenient hill slopes for several miles up and down the river had been stripped of their timber to supply this demand.

David Ruffner, true to the spirit of enterprise and pluck which bored the first well, was the first here to use coal as a fuel. This would appear to be a very simple matter now; but was not so then. It was only after many months of discouraging efforts, and failing experiments, that he finally succeeded in getting it to work to his satisfaction. Its value established, however, its use was, at once, adopted by the other furnaces, and wood ceased to be a fuel for salt-making in Kanawha.

Other important improvements were gradually going on in the manner of boring, tubing and pumping wells, etc. The first progress made in tubing, after Ruffner's compound wood-and-wrapping-twine tube, was made by a tinner, who had located in Charleston to make tin cups and coffee pots for the multitude. He made tin tubes in convenient lengths, and soldered them together as they were put down the well. The refinement of screw joints had not yet come, but followed shortly after, in connection with copper pipes, which soon took the place of tin, and these are recently giving place to iron.

In the manner of bagging the wells, that is, forming a water-tight joint around the tube to shut off the weaker waters above from the stronger below, a simple arrangement called a "seed-bag," was fallen upon, which proved very effective, which has survived to this day, and has been adopted wherever deep boring is done, as one of the standard appliances for the purpose for which it is used. This seed-bag is made of buckskin, or soft calfskin sewed up like the sleeve of a coat or leg of a stocking; made 12 to 15 inches long, about the size of the well hole and open at both ends; this is slipped over the tube and one end securely wrapped over knots placed on the tube to prevent slipping. Some six or eight inches of the bag is then filled with flaxseed, either alone or mixed with powdered gum tragacanth; the other end of the bag is then wrapped, like the first, and the tube is ready for the well. When to their places—and they are put down any depth, to hundreds of feet—the seed and gum soon swell from the water they absorb, till a close fit and water-tight joint are made.

The hydraulic contrivance for raising salt water from the gums, consisting of a bucket, a swape and a man, was simple, slow and sure; but the spirit of progress was abroad and it soon gave place to a more complicated arrangement, consisting of a pump, lever, crank, shaft, and blind horse or mule, that revolved in its orbit around the shaft. This was considered a wonderful achievement in mechanical contrivance, especially by the men who had worked the swapes.

For several years this "horse-mill," as it was called, was the only mode of pumping salt water on Kanawha, but in the fullness of time it also went to the rear in 1828, and the steam engine came to the front, not only for pumping, but also for boring wells and various other uses.

In 1831 William Morris, or "Billy" Morris, as he was familiarly called, a very ingenious and successful practical well borer, invented a simple tool, which has done more to render deep boring practicable, simple and cheap, than anything else since the introduction of steam.

This tool has always been called here "Slips," but in the oil regions they have given it the name of "Jars." It is a long double-link, with jaws that fit closely, but slide loosely up and down. They are made of the best steel, are about 30 inches long, and fitted, top and bottom, with pin and socket joint, respectively. For use they are interposed between the heavy iron sinker, with its cutting chisel-bit below, and the line of augur poles above. Its object is to let the heavy sinker and bit have a clear, quick, cutting fall, unobstructed and unencumbered by the slower motion of the long line of augur poles above. In the case of fast augur or other tools in the well, they are also used to give heavy jars upward or downward, or both, to loosen them. From this use the oil well people have given them the name of "Jars."



SITE OF BURNING SPRINGS
KANAWHA CO. WEST. VA.



GUM LOG CONDUCTOR FOR SALT WELLS
BURNING SPRINGS, KANAWHA CO. W.VA



LOCATION OF THE FIRST HOLE EVER
DRILLED IN AMERICA WITH SPRING POLE
RODS AND TOOLS, DANA, KANAWHA CO. W.VA



SALT WELLS
MALDEN, KANAWHA CO. W.VA.

Billy Morris never patented his invention, and never asked for nor made a dollar out of it, but as a public benefactor, he deserves to rank with the inventors of the sewing machine, reaping machine, planting machine, printing cylinders, cotton gin, etc.

This tool has been adopted to general use wherever deep boring is done, but, outside of Kanawha, few have heard of Billy Morris, or know where the slips or jars came from.

The invention of this tool, the adoption of the heavy sinker and some other minor improvements in well boring, gave a great impetus to deep boring in Kanawha. Wells were put down 500, 1,000, 1,500, and 1,800 feet, and one, the deepest in Kanawha, by Charles Reynolds, to about 2,000 feet. These borings would doubtless have been carried to a much greater depth, but that the fact soon got to be understood, that the salt-bearing strata had been passed, and that no brines were obtained at a greater depth than 800 to 1,000 feet. The limit of the salt-bearing rocks is readily told by the character of the borings. Within this limit are sandstones, shale, coal, etc., of the Coal Measures lying nearly horizontal, though dipping slightly to the northwest; below is the Carboniferous Limestone, which underlies the Coal Measures, and crops out 100 miles to the eastward. This limestone, when penetrated, is known to the well-borers as the "long-running rock," from the fact that a boring-bit will run a long time in it without being dulled.

No regular suites of samples of borings from the Kanawha wells have ever been kept. This is not important, however, as the strata are well known, and can be examined along the New river canon as they crop out to the eastward.

The Kanawha borings have educated and sent forth a set of skilful well-borers, all over the country, who have bored for water for irrigation on the western plains, for artesian wells for city, factory, or private use, for salt water at various places, for oil all over the country, for geological or mineralogical explorations, &c., &c.

Nearly all the Kanawha salt wells have contained more or less petroleum oil, and some of the deepest wells a considerable flow. Many persons now think, trusting to their recollections, that some of the wells afforded as much as 25 to 50 barrels per day. This was allowed to flow over from the top of the salt cisterns, on to the river, where, from its specific gravity, it spread over a large surface, and by its beautiful iridescent hues, and not very savory odor, could be traced for many miles down the stream. It was from this that the river received the familiar nickname of "Old Greasy," by which it was for a long time familiarly known by Kanawha boatmen and others.

At that time this oil not only had no value, but was considered a great nuisance, and every effort was made to tube it out and get rid of it. It is now the opinion of some competent geologists, as well as of practical oil men, that very deep borings, say 2,500 feet, would penetrate rich oil-bearing strata, and possibly inexhaustible supplies of gas.

In 1775, General Washington visited the Kanawha valley in person, and located some very valuable lands for his military services. About three miles above the Salt Lick he set apart and deeded to the public, forever, a square acre of land near the river, on which was a great natural wonder, then little understood, called a "burning spring." For many, many years after, it was visited by every one who came to or passed through Kanawha, as one of the great curiosities of the region. It was simply a hole in the ground, which filled with water when it rained, and up through which issued a jet of gas, giving the water the appearance of boiling, and when lighted burned with a bright flame till blown out by high wind.

In 1841, William Tompkins, in boring a salt well a short distance above the burning spring, struck a large flow of gas, which he turned to account by "boiling his furnace" and making salt with it, effecting a great saving in fuel and economy in the cost of salt.

In 1843, Messrs. Dickinson & Shrewsberry, boring a few rods below, tapped at about 1,000 feet in depth, nature's great gas reservoir of this region. So great was the pressure of this gas, and the force with which it was vented through this bore-hole, that the augur, consisting of a heavy iron sinker, weighing some 500 pounds, and several hundred feet more of augur poles, weighing in all, perhaps 1,000 pounds, was shot up out of the well like an arrow out of a cross-bow. With it came a volume of salt water, which stood probably 150 feet high. The roaring of this gas and water, as they issued, could be heard under favorable conditions for several miles.

It would have been difficult to estimate with any approach to accuracy, the quantity of gas vented by this well, and no attempt was made to measure it. I heard it roughly estimated as being enough to light London and Paris, with, perhaps, enough left to supply a few such villages as New York and Philadelphia. But as this is a *salt* well, as well as *gas* well, I suggest that the gas estimates be taken, *"cum grano salis."*

The salt water and gas from this well were partially collected, and conveyed through wooden pipes, to the nearest furnace, where they were used in making salt.

For many years this natural flow of gas lifted the salt water 1,000 feet from the bottom of the well, forced it a mile or more through pipes, to a salt furnace, raised it into a reservoir, boiled it in the furnace, and lighted the premises all around at night. About the only objection to the arrangement was that it did not lift the salt and pack it in barrels.

The success of this well induced other salt-makers to bore deep wells for gas, and several were successful. Messrs. Worth & English, Tompkins & Co., Wm. D. Shrewsberry, J. H. Fry, and J. S. O. Brooks got gas wells and used the gas either alone, or in connection with coal, for fuel in salt-making. Gas was also struck in a few other wells, but did not last long, and was not utilized.

The first flow of gas ever struck in Kanawha was as far back as 1815, in a well bored by Capt. James Wilson, within the present city limits of Charleston, near the residence of C. C. Lewis, Esq.

The Captain had not gotten as good salt water as he expected; but instead of being discouraged, he declared in language emphatic, that he would have better brine or bore the well into the lower regions, with higher temperature.

Shortly after this the augur struck a cavity which gave vent to an immense flow of gas and salt water.

The gas caught fire from the grate near at hand, and blazed up with great force and brilliancy, much to the consternation of the well borers and others. Captain Wilson thought it would be a reckless tempting of Providence to go any deeper, and ordered the boring stopped.

This well is now owned by the Charleston Gas Light Company, who at some future time contemplate re-opening it to test the gas for lighting the city.

Of the many wells in the neighborhood that have furnished gas, some have stopped suddenly, and some by a slow and gradual process. Whether these stoppages have been from exhaustion of the gas, or sudden, or gradual stoppage of the vent-ways, has not been definitely determined. It is known, however, that in the Dickinson & Shrewsberry well, which blew longer than any other, that the copper pipes in the well, and the wooden pipes leading to the furnace, were lined with a mineral deposit, in some places nearly closing them. This deposit has not been analyzed, but may possibly be silicate of lime. A system of torpedoing might break up these incrustations from the walls of the well and rock cavities, and start the gas again.

From the results of such wells in Pennsylvania and New York we have large encouragement to hope for similar results here.

A few wells intelligently manipulated might give gas enough to boil all the salt manufactured here, and run all the machinery in the neighborhood.

After the introduction of steam power, and the use of coal for fuel, no striking change was effected in the process of salt manufacture for a number of years. What improvements were made were simple in degree. Wells were bored deeper, the holes were bored larger, the tubing was better, the pumps and rigging simpler. The furnaces were larger, better constructed, and more effectively operated, the quality of the salt improved and the quantity increased, but still they were kettle furnaces of the original type.

The mammoth of the kettle era was that of Joseph Friend & Son, at the mouth of Campbell's creek, on which they made 100,000 bushels of salt per annum. The usual capacity of other furnaces was 25,000 to 50,000 bushels per annum.

This was about the condition of the salt manufacture here in 1835, when there were, all told, about 40 furnaces, producing annually about 2,000,000 bushels of salt.

During this year George H. Patrick, Esq., of Onondaiga, New York, came here, to introduce a patent steam furnace.

The furnace proper, after it was developed and improved, consisted of cast iron pans, or bottoms, 8 to 10 feet by 3 feet. Eight or ten of these pieces were bolted together by iron screws, forming one section 24 to 30 feet long, by 8 or 10 feet wide. There were two, three or four of these sections, according to the size of the furnace. Over each of the sections was constructed a wooden steam chest, bolted to the flanges on the sides of the pans and otherwise held together by wooden clamps and keys, and iron bolts and rods, all made steam and water tight by calking. These several sections are set longitudinally on the furnace walls to form one continuous furnace.

After the furnace comes a series of wooden vats or cisterns, a usual size for which is about 10 feet wide and 100 feet long. The number of these cisterns varies according to the size of the furnace. They are constructed of poplar plank, 4 to 5 inches thick, dressed to joints, and fitted in a frame of oak by sills and clamps. They are tightened by driving wooden keys, and then calked to make them water tight. This system of clamping and keying cisterns was introduced here from a model brought by Col. B. H. Smith, from the navy yard at Norfolk. It was very simple and effective, and has been retained to this day, without improvement or change.

There are two sets of these cisterns, the first in which the brines after boiling in the furnace proper, are settled, and at the same time strengthened up to saturation. The latter in which the salt is graduated from the clear saturated brines. These settling and graining cisterns are very much alike, except that the grainers are but 15 to 18 inches deep, while the settlers may be double that or more. Through each and all of these cisterns from end to end are three rows of copper pipes, usually 5 inches in diameter.

After the salt water is boiled in the furnace proper, it runs into these settling cisterns, and after being thoroughly settled and saturated, is drawn into the grainers, where the salt is deposited, and once in 24 hours is lifted out by long-handled shovels, on to a salt board, suspended above the grainer, and from which, after proper draining, it is wheeled in wheel barrows to a salt house, where it is packed in barrels ready for shipment.

The steam generated by the boiling in the furnace proper is carried from the steam chest, by wooden pipes, to the copper pipes and through the settlers and grainers. This steam giving up its heat in passing through these cisterns, keeps up the temperature of the brines, and causes rapid evaporation. The temperature of these cisterns varies from 120 degrees to 190 degrees; an average would probably be 165 degrees.

This, in short, is a description of the steam furnace, after it was improved, and the first mistakes and crudities eliminated. In the first experiments only very slight heat was imparted by the steam to the brines, and only very coarse or alum salt made. It was very simple, accomplished all that was expected, and so soon as it was fairly tested, improved up to its working condition, and its advantages demonstrated, the days of the kettle furnaces were numbered.

Andrew Donnally and Isaac Noyes were the first to try and adopt the plan. Then followed John D. Lewis, Lewis Ruffner, Frederick Brooks, and others, till all had made the change; and when the Ohio river furnaces were built, the system was fully adopted there.

Thus, this oil not only seems to have been known, but to have been systematically gathered in very early times. Upon the bottom lands of Titusville, Pa., were many acres of cradle-holes dug out and lined with split logs, evidently constructed for the purpose of gathering oil. The fact that the earliest English-speaking inhabitants could never discover any stumps from which these logs were cut, and the further fact that trees of great size were found growing in the midst of these cradles, are evidences that they must have been

operated long ago, but by whom is a question as yet unsolved. Some have suggested that it was the work of the mound builders, but the writer indulges in no such belief. It is more reasonable to suppose that the French, who knew of its location, utilized this greasy product to a *considerable* extent for medicinal and other purposes, and arranged these holes, or pits, as a means of gathering it. They were in possession of this region for more than a hundred years before it was personally known to the English-speaking whites, and during that great period there was ample time for the stumps of trees taken to line these pits to crumble to dust, as well as for small trees to attain great proportions. Two miles north of Burning Springs, Wirt County, West Virginia, on the north branch of Burning Spring run, the writer in May 1903 found a sycamore tree growing on an old brick furnace that was used in the sixties. The tree is thirty feet high and eight inches in diameter. What proportions will this tree attain in one hundred years. General Irvine, during his exploring expeditions along the Allegheny river and its tributaries in the summer of 1785, visited Oil creek, Pennsylvania, and in his report says: "Oil creek has taken its name from an oil or bituminous matter found floating on the surface. Many cures are attributed to this oil by the natives (meaning the Indians) and lately by some whites."

For many years the usual means of gathering this product of nature, which finally became known as "Seneca Oil," by virtue of having been first discovered by the Seneca Indians, was by throwing a woolen cloth or blanket upon the water, which the oil floated on, and then wringing the cloth over a wooden or stone vessel. The clean wool absorbed the oil and rejected the water, and in this way a considerable quantity was obtained. The oil was then bottled in small vials and sold by peddlers in many parts of the country as a sure cure for rheumatism, sore throat and various aches and pains. At this early date it was noticed by the white men that the Seneca Indians had long, black, shining hair and that their beautiful hair was envied by the other Indian nations. The Senecas used this oil on their heads as the Americans do the hair oils that are made from the same kind of oil to-day. Between 1825 and 1830 we find the white settlers on Oil Creek, Pennsylvania, dipping oil from holes dug near where the oil seeps out of the ground. Logs and timbers were formed in a hollow square, with openings on the up stream end, and anchored in the water on Oil Creek. The oil floating on the top of the water was caught in the log pens, which were commonly called oil coops. Each morning and evening the oil was skimmed off the water in the coops. These pens were known as oil coops in the early days of Oil Creek. From 1830 to 1839 nothing new had taken place on Oil Creek or at the oil springs at Cuba, New York. However, in the year 1839 Samuel M. Kier and his father, Thomas Kier, of Pittsburg, Pa., had a well drilled on the bank of the Allegheny river about one mile above Tarentum, Pa. The well was drilled for salt water brine by a Kanawha, W. Va., salt well (borer) driller, Joseph Doty, Sr., by name. The spring pole system of drilling was used. This is the first drilled well we have any record of in Pennsylvania.

After the well was drilled deep enough to find salt water the water rose to the surface and ran over at the mouth of the well. After some months oil made its appearance and mixed in considerable quantities with the salt water. About the same time Lewis Peterson, Sr., discovered oil in a well he had drilled on his farm adjoining the Messrs. Kier's. The accumulation on Mr. Peterson's premises was so considerable that it became troublesome and had to be removed by means of surface drains. But after letting the oil run into the river for some time the idea came to Mr. Peterson that the oil might be used to oil machinery, and in the year 1845 he presented Mr. Morrison Foster, of the Hope Cotton Factory, located at Pittsburg, Pa., with a bottle of oil gathered from the salt water from his well at Tarentum. Mr. Foster, in conjunction with the manager of the spinning department of the mill, Mr. David Anderson, experimented with the oil, and soon found that by a certain process it could be combined with sperm oil in such a way as to form a better and cheaper lubricator for the finest cotton spindles than the best sperm oil. Mr. Peterson supplied two barrels of oil each week for ten years before it was made known. This was the first practical use of petroleum (crude oil) in America.

And next we find Mr. Samuel M. Kier, with that practical sagacity with which he was distinguished, could not believe that this (then mysterious production of nature) had been made in vain. He was convinced that there must be a want somewhere which it was intended to supply. As an experiment the oil was bottled and introduced as a medicine. Chemistry had frequently shown that petroleum possessed several valuable medical properties, but in Mr. Kier's early essays the science of advertising was not understood, or at least but little resorted to, and his "patent medicine" speculation failed. In 1842 Samuel M. Kier became fully impressed with the conviction that the oil from his salt water well had its important uses. At this early date he submitted samples of petroleum (crude oil) to Professor J. C. Booth, of Philadelphia, Pa., who, after a careful analysis of it, recommended him to offer it to a New York gutta-percha company, who were seeking a proper solvent for this gum. The gutta-percha company's experiments with it were not satisfactory. After mature reflection by Professor Booth he became convinced that by distillation an excellent burning oil could be obtained from the crude oil. He then furnished Mr. Kier with drawings for a suitable still. Mr. Kier returned to Pittsburg, Pa., constructed a still and put it in active operation. The product he named "carbon oil," by which designation it was for a long time generally known. At this time lamps adapted to the proper use of "carbon oil" had not been invented, and other uses for crude and refined oils had not yet arisen, and again Mr. Kier's project met with indifferent success. Three years later Mr. Kier started his sixty-gallon still "refinery" again near his salt well at Tarentum. In the meantime his salt water well was tubed and started to pump, and in a short time the head of salt water became exhausted and petroleum (crude oil) appeared and was pumped freely. Thus in the year 1845 was established the first "oil pumping well" known to the oil world. But years were yet to elapse before human knowledge

should attain to a full comprehension of this singular discovery, destined to effect the greatest trade revolution known to modern commerce. After pumping the well a short time the stock of petroleum (crude oil) became in excess of the market, and at this time very little illuminant or refined oil was used. However, in a short time the coal oil excitement commenced, and mineral oil as an illuminant came into general use, as lamps adapted to refined oil were now invented, with the cheapness, brilliancy and safety combined to recommend them. For some unknown cause Mr. Kier could not sell his oil and after considerable negotiations with a Mr. Ferris, of New York City, contracted for the greater portion of the well's production in crude. In the year 1850 Brewer, Watson & Co. came into possession of all the timber in and around the then village of Titusville, Pa., and thousands of acres of land on Pine and Oil creeks, in Crawford and Venango counties, Pa. This was the land the oil springs near Titusville, Pa., were located on. At this date the oil drippings from these springs and coops were neglected, as the oil for curative purposes was getting to be very common and would not sell as fast as the springs would supply it.

In a paper communicated to the "American Journal of Science," for July, 1833, on *"The Saliferous Rock Formation in the Valley of the Ohio,"* by Dr. S. P. Hildreth, of Marietta, touching incidentally on the subject of Carburetted-Hydrogen Gas and Petroleum, says: "All salt wells afford more or less of this interesting gas, an agent intimately concerned in the free rise of the water, and universally present where salt water is found. Indeed, so strong is the evidence afforded by the rising of this gas to the surface of the existence of the salt rock below, that many wells are sunk on this evidence alone. It is without doubt a product of the saliferous formation, as it rises in many wells without any appearance of petroleum, which latter product is probably generated by bituminous coal, and in all wells, from a depth far below where coal has been discovered in sufficient quantity to furnish such an immense and constant supply as is continually rushing from the earth in these saliferous regions. In many wells, salt water and inflammable gas rise in company with a steady uniform flow. In others, the gas rises at intervals of ten or twelve hours, or perhaps as many days, in vast quantities, and with overwhelming force, throwing the water from the well to the height of fifty or one hundred feet in the air, and again retiring within the bowels of the earth to acquire fresh power for a new effort. This phenomenon is called "blowing," and is very troublesome and vexatious to the manufacturer. The explosion is sometimes so powerful as to cause the copper tube which lines the upper part of the well to collapse, and to entirely misplace and derange the fixtures about it. By constant use this difficulty is sometimes overcome by the exhaustion of the gas, and in others the wells have been abandoned as hopeless of amendment.

A well on the Muskingum, ten miles above McConnelsville, at six hundred feet in depth, afforded such an immense quantity of gas, and in such a constant stream, that while they were boring, it several times took fire from the friction of the iron on the poles against the sides of the wall, or from the scintillations from the augur, driving the workmen away, and communicating the flame to the shed which covered the works. It spread itself along the surface of the earth, and ignited several combustible bodies at the distance of several rods. It became so troublesome and difficult to extinguish, whenever ignited, being in this respect a little like the Greek fire so celebrated by Gibbon, that from this cause only the well has been abandoned. In the days of superstition and ignorance this would doubtless have been attributed to the anger of the genius who presided over the spot, and thus protected it from the unhallowed approaches of man.

At A. P. Stone's well, on the opposite side of the river, a little below McConnelsville, the gas rises in small regular puffs or discharges, averaging one for every minute or two, causing the water to flow in jets from the spout as it falls into a large cistern below. The water rises in the head through a bored log to the height of twenty-five feet above the surface of the earth. Through a hole in the top of a small receiver cup, the gas rises in a constant stream, and when a candle or torch is applied, kindles into a beautiful flame, burning steadily until extinguished by closing the hole—affording in the stillness and darkness of midnight a striking and interesting phenomenon. It is supposed that this well alone furnishes sufficient gas, if properly applied, to light the town very handsomely. No petroleum rises with it, and very little in any of the other wells of this locality. The quantity of gas in different wells varies very considerably; all, however, afford sufficient to keep the water in constant agitation over the mouth of the well. The supply of water depends very much on the quantity of gas discharged. A few miles above Charleston, on the Big Kanawha, great quantities of the carburetted hydrogen are slowly emitted through the earth. A tract of several rods in extent, near the river bank, is so charged with it that on making shallow cavities in the sand, and applying a fire-brand, it immediately becomes ignited, and burns with a steady flame for an indefinite period, or until extinguished by covering it with sand. The boatmen, a rude but jolly race, often amuse themselves by tracing a circle in the sand around some one of the company unacquainted with the mystery, and, applying fire, a flame immediately springs up as if by magic around the astonished wight, which, being entirely confined to the circle traced, adds much to his terror, and increases the delight of his boisterous companions. In a short time the sand beneath the burning gas becomes red hot. The neighboring women sometimes make use of it to boil their water when washing clothes on the bank of the river, and boatmen occasionally cook their food in the same easy and cheap manner. This spot would afford a fine site for the temple of the fire-worshippers of ancient Persia. In low stages of the water, gas and oil are seen oozing from the bed of the river at various points. On the Little Muskingum river, a few miles from Marietta, this gas is discharged in many places—often through a pool or sink-hole filled with water—in which case it is called a burning spring. Petroleum is often found rising from the earth near the spring. Throughout the whole saliferous region, so fa. as I have any

knowledge, on penetrating the salt rock a greater or less quantity of carburetted hydrogen gas is discharged through the opening; in some places accompanied by petroleum, and in others without this co-existent production."

Continuing, he says of

Petroleum or Fossil Oils

Since the first settlement of the country west of the Apallachin range, the hunters and early pioneers have been acquainted with this oil. Rising in a hidden and mysterious manner from the bowels of the earth, it soon arrested their attention, and acquired great value in the eyes of these simple sons of the forest. It was thought to be a sovereign remedy for nearly all the diseases common to those primeval days; and from its success in rheumatism, burns, coughs, sprains, &c., was justly entitled to all its celebrity. It acquired the name of Seneca Oil—that by which it is generally known—from having first been found in the vicinity of Seneca Lake, New York. From its being found in limited quantities, and its great and extensive demand, a small vial of it would sell for forty or fifty cents. It is at this time in general use among the inhabitants of the country for saddle bruises and that complaint called the scratches in horses. It seems to be peculiarly adapted to the flesh of horses, and cures many of their ailments with wonderful certainty and celerity. Flies and other insects have a natural antipathy to its effluvia, and it is used with much effect in preventing the deposit of eggs by the "blowing fly" in the wounds of domestic animals during the summer months. In neighborhoods where it is abundant it is burned in lamps in place of spermaceti oil, affording a brilliant light, but filling the room with its own peculiar odor. By filtering it through charcoal much of this empyreumatic smell is destroyed, and the oil greatly improved in quality and appearance. It is also well adapted to prevent friction in machinery; for, being free of gluten, so common to animal and vegetable oils, it preserves the parts to which it is applied for a long time in free motion. Where a heavy vertical shaft runs in a socket it is preferable to all or any other articles. This oil rises in greater or less abundance in most of the salt wells on the Kanawha, and collecting as it rises in the head on top of the water, is removed from time to time with a ladle, and put by for sale or use.

The greater abundance of stone coal in this locality, than in that of the Muskingum, gives it a decided advantage in the elaboration of petroleum. On the latter river the wells afford but little oil, and that only during the time the process of boring is going on. It ceases soon after the wells are completed, and yet all of them abound more or less in gas.

A well on Duck Creek, about thirty miles north of Marietta, owned by Mr. McKee, furnishes the greatest quantity of any in this region. It was dug in the year 1814, and is four hundred and seventy-five feet in depth. Salt water was reached at one hundred and eighty-five feet, but not in sufficient quantity. However, no more water was found below this depth. The rocks passed were similar to those on the Muskingum River, above the flint stratum, or like those between the flint and salt deposits at McConnelsville. A bed of coal two yards in thickness was found at the depth of one hundred feet, and gas at one hundred and forty-four feet above the salt rock. The hills are sandstone, based on lime, one hundred and fifty or two hundred feet in height, with abundant beds of stone coal near their feet. The oil from this well is discharged periodically, at intervals of from two to four days, and from three to six hours' duration at each period. Great quantities of gas accompany the discharges of oil, which for the first few years amounted to from thirty to sixty gallons at each eruption. The discharges at this time are less frequent and diminished in amount, affording only about a barrel a week, which is worth at the well from fifty to seventy-five cents a gallon. A few years ago, when oil was most abundant, a large quantity had been collected in a cistern holding thirty or forty barrels. At night some one engaged about the works approached the well-head with a lighted candle. The gas instantly became ignited, and communicated the flames to the contents of the cistern, which, giving way, suffered the oil to be discharged down a short declivity into the creek, where the water passes with a rapid current close to the well. The oil still continued to burn most furiously, and, spreading itself along the surface of the stream for half a mile in extent, shot its flames to the tops of the highest trees, exhibiting the novel and perhaps never-before witnessed spectacle of a river actually on fire.

Here we find Petroleum obtained more than thirty years before its final development, yet attended with all the accidents, and presenting all the phenomena that characterize its production in Pennsylvania. These are not accounts open to the suspicion of exaggeration. They were written and published more than a generation before the *philosophy* of Petroleum broke upon the understanding of man. Here we find it repeatedly forced upon his attention in the very way it was finally developed, and still the idea of artesian drilling was never designedly applied to the production of Petroleum till at last suggested, as is often the case with great ideas, by a most trivial occurrence.

Here was a well drilled for salt to the depth of six or eight hundred feet—to the average depth of Petroleum wells in Pennsylvania in 1865—producing scarcely anything but Petroleum, every well in the region throwing up more or less of the oil, and yet it seems never to have occurred to any one that if drilled for expressly, it could be found in paying quantities.

What a comment on the narrowness of a mind preoccupied! How have we overlooked all the great truths of philosophy, until at last they secured a sprouting place in some mind unprejudiced by practice and unbiased by theory? And then we call it inspiration, when the germ that has fallen in good ground, and sprouted, and blossomed, and borne fruit, has proved to be such a very wonderful little seed, and one that all saw, and none comprehended, when it was lying exposed in the stony places. And then we wonder we had not comprehended it before, especially as it was easier to comprehend it—the simple, little idea—than to shut it out from our understanding as the thing quite incomprehensible.

Its value as a lubricator was indisputably established; its medicinal properties were appreciated; very

little stood in the way of its adaptation to purposes of illuminating, and so much of even that objection was removed by the simple process of filtering through charcoal—on which process a patent had been obtained—that in the light of present events, it is impossible to understand how its importance could have been overlooked, could have failed to suggest, if not the philosophy of its existence in the earth, the manner in which it is held among the rocks, at least the hope of making a fortune by developing it after the manner of raising brine.

Nathaniel Cary, of Cornplanter Township, Venango County, Pa., was the first white man to sell Seneca Oil as a specific for rheumatism and other ailments of humanity from 1806 to 1815.

Even thirty-eight years later we find Mr. Kier, of Pittsburg, profitably engaged in bottling and selling it as a great natural panacea; consuming in this way regularly about three barrels a day, obtained from his father's salt well at Tarentum, a few miles above Pittsburg, on the Allegheny River, labelling his bottles to the effect that this most wonderful remedy was obtained four hundred feet below the surface of the earth —distilling it, even, so that nearly every objection to it as an illuminator in the crude state was removed, and yet pocketing the returns without giving a thought to its origin or extent.

With Mr. Kier naturally enough the consideration was to utilize what he had, to make the most of it, rather than by research and development to bring forth that which would have been in every sense a drug in the market. He grasped one idea—its utility, and suggested the next—its development.

Thus, link by link, was forged slowly, the chain of events which united thought and action, effecting what is known as the "discovery" of Petroleum.

THE DISCOVERY OF THE VALUE OF PETROLEUM.

The reader will hardly need to be informed that the circumstances related here were not what led to the discovery of the economic value of Petroleum. There can hardly be said to be any merit in witnessing and describing circumstances purely accidental in their occurrence, when to do so effects no impression useful to the cause of human progress. However accidental, the events referred to must be allowed to have been very suggestive; but, inasmuch as they did *not* suggest anything of practical importance to the very intelligent gentlemen who beheld them, it would seem to increase our obligations to the person who finally did grasp the simple idea of the philosophy of Petroleum, and that without any knowledge of the circumstances mentioned. But it must be conceded that, in their cases, a most important incentive was wanting—the article had no certain market, no determinate value. The fact that it sold for fifty and twenty-five cents a gallon proves nothing. It sold for that in 1859, but the first day's production of the first well "broke the market." There was no demand for it, because its uses were unknown —or, at least, not definitely understood. If any one thinks that a larger and more constant supply would have earlier brought about a knowledge of its importance (had that supply been accidentally obtained, and had its continuance been altogether conjectured), let him reflect how comparatively slow was its introduction to general use even when the supply was so large that its cost was merely nominal, and its continuance an established fact. No! The world was not yet ready for it. And, though the long course of scientific research in other directions, which prepared for its final reception, has escaped public attention, it is easy to show that the way was not prepared in a moment; but it is difficult, looking back from the light of the present, to excuse a stupidity which cannot now be understood, because it has been outgrown.

No science has been more active, progressive, and useful in the last sixty years than Chemistry. But its strides have been as silent as they have been rapid; and though as a science it has almost grown up within the age of living men, and while it has done more, perhaps, than all other sciences to enable us to understand physical relations, there are still plenty of intelligent people who know no more of it than the name. It is mainly to this science that we owe those elaborate experimental researches which demonstrated the practical utility of Petroleum to the domestic comforts of refined civilization.

About the year 1830 a German chemist named Herr Reichenbach, while experimenting with the bitumen found in wood, discovered a white, tasteless, inodorous, waxy substance which he called Paraffine, because of its antipathy to unite with other substances. Like Louis Selligne, of France, Reichenbach had devoted much attention to the production of illuminating oils from coals and bituminous shales in his own country, as well as various other portions of the Continent of Europe, and like him experimented for years without producing anything of value.

The small quantity of paraffine obtained was hoarded as a curiosity of the laboratory, and for many years, it is said, was the only bit of that substance in existence. It does not appear that Reichenbach himself at the time clearly understood the chemical change by which it was produced, but his researches were continued, and together with Selligne's and several others, his name now appears as the inventer or discoverer of kerosene, or coal oil. It seems likely that either of them is entitled to all he claims, for they appear to have worked separately; and aside from the meagre details of their process given to the scientific journals of the day, to have known little of each other's experiments.

It is true, no vast credit can attach to the invention or discovery on account of originality, for the way was very clearly pointed out by facts already known. But its importance can hardly be overestimated. The refining influence—we might say the civilizing influence —of a good cheap illuminator, could easily be shown if this were the place for an extended essay on the subject.

The introduction of gas in the cities of Asia and Europe furnish statistics on the subject most interesting from the political, as well as the humanitarian point of view. But the want of an illuminator for the habitations of the poor, and for such places as could not be economically lighted with gas was manifest, and in obedience to a common want we find it invented *almost* simultaneously in three countries—England,

France and Germany—occupying the same plane in civilization. Such coincidences frequently occur; but it is a *remarkable* fact that they never occur unless the invention has become a manifest necessity to the comfort of the society, and the progress of the civilization which the inventors have enjoyed.

Reichenbach's ounce or two of Paraffine was preserved for many years as a great curiosity to his scientific friends. A small quantity of it was also discovered by Selligne, a few years later; but it was reserved for Mr. James Young, of Scotland, to complete the value of the discovery by showing how to produce it at will, and in quantity, and by utilizing it to the comforts of mankind. In 1850 he procured a patent in England for the manufacture of "paraffine oil, or oil containing paraffine, and paraffine from bituminous coals." Some years later a similar patent was issued to him by the government of the United States.

Before this oil had been manufactured from bituminous shales and coals on a small scale in France—by Selligne—in Germany, and in the Austrian Empire. Even on the American Continent, Dr. Abraham Gesner manufactured oil from coal as early as 1846, and exhibited the same in the course of his lectures in the British Provinces. Uniting himself with capitalists, Mr. Young promptly began the manufacture of paraffine oil on a large scale. No lamp had yet been invented in which it would burn without a most offensive smoke, and while the heaviest of this manufacture was used for lubricating machinery, the lightest was reduced to paraffine wax, manufactured into candles, and sold as spermaceti, to which it bears a striking resemblance. It is a product obtained by destructive distillation of the oil—that is, one substance is destroyed before the other is produced. The change which takes place is purely chemical, and not mechanical, as it would be if the paraffine was separated from the oil by which it was merely held in solution. Mr. Young's process consisted in breaking the coals into pieces about the size of a hen's egg, which were then distilled in the common gas retort, with worm pipes and the ordinary refrigerators of stills, the water in them being kept at a temperature of about 55 degrees Fahr., by a stream of cold water entering the worm cistern. The retort was kept at a low red heat, and heated up gradually. The product was an oil containing the paraffine.

The crude oil was put into a cistern, and steam heat applied up to about 156 degrees. This separated some of the impurities, and the oil was run off into another vessel, leaving the impurities behind. The oil was then distilled in an iron still, with a worm pipe and refrigerator, the water in the latter being kept at 55 degrees Fahr. The oil thus distilled was then agitated with 10 per cent. of sulphuric acid for an hour. It was then allowed to settle twelve hours, when it was drawn off and distilled with half its bulk of water, which was run into the still from time to time to supply the quantity distilled off. The light oil came over with the steam, and was employed for illumination. The oil left in the still was carefully separated from all water and put into a leaden vessel, and then agitated with two per cent. of sulphuric acid. It was then allowed to settle twenty-four hours. This oil was then run into another vessel, and for every one hundred gallons there was added twenty-eight pounds of chalk ground up with water into a paste. The oil and chalk were agitated together until the oil was freed of acid. After it had remained a week at rest, it was used for lubricating machinery, and was mixed with animal and vegetable oils for that purpose.

To obtain the Paraffine the oil containing it was brought down to a temperature of 30 degrees Fahr., when paraffine will crystallize and separate itself from the oil; or it may be filtered and finally submitted to pressure. Again it was agitated with its bulk of sulphuric acid, and the operation repeated until the acid ceased to be colored by the paraffine, which was kept melted during the operation.

Mr. Gerker's method differed from this not very materially, but had for its object not the production of paraffine, and therefore the similarity of the treatment ceased just where the production of paraffine began.

His purpose was merely to procure an illuminating oil, which he called "Kerosene," a name almost identical in its meaning with "Paraffine Oil." The patents granted him by our government, known as the "Kerosene Patents," were sold to the North American Kerosene Gas Light Company, of New York, which in 1854 began the manufacture of Kerosene Oil at their works on Newtown Creek, Long Island, New York. Its introduction was discouragingly slow. The refining process was not thoroughly understood, and nothing had then been found to overcome the odor, which was most offensive. Men interested in the manufacture of camphene, and burning fluids of all sorts spread the belief that it was very explosive. But the beauty of its light commended it in spite of the odor and the fear of explosion, though in fact when first manufactured it was no more explosive than ordinary sperm oil. One great apparent need was a lamp which would burn it without a smoke, and admit of its being moved around, which could not be done when it was burned in the camphene lamp. This difficulty was afterwards remedied by the introduction of the Vienna burner by Mr. J. Austin.

Mr. Young's patents specified a paraffine oil from "coals." The great profit of the business induced many to embark in the manufacture of the oil, and he soon found that his patent-right was being invaded both in this country and England. Proceedings were instituted at once to compel the payment of a royalty of three cents per gallon, and also for damages by infraction of the patent-right. In most cases these were strenuously resisted; the defendants in many cases claimed that their oils were not from coals, but from bituminous shales and asphaltum. These gave the proprietors of the lands with whom for the most part sharp bargains had been driven, a pretext for checking the despoliation of their property, under contracts for the removal of coal, and Mr. Young, in common with many of the other English manufacturers, found himself involved in litigation that threatened to prove interminable, and was only settled at last by compromise. One of the best effects of these costly suits was a most exhaustive scrutiny into all the varieties of coals and bitumens, and, though in a few instances carboniferous deposits, which were clearly shown to be asphalts or of that nature, by their solution in benzine and naphtha,

were pronounced "coals" by ignorant jurors, and did not affect the value of those researches to the industries of the world, nor change the opinions of educated men. Mr. Young's patent, after having been the source of a princely fortune, expired in England in 1864, and four years later in the United States, but it had brought him no revenue from this country since the discovery of Petroleum in Pennsylvania.

Before that event took place, however, a market was being prepared for it on the continent of Europe, by the manufacture on an extensive scale of oils from coals, schists and bituminous shales.

In Germany, on the Rhine, and in various parts of France and Switzerland, large manufactories were erected, and it soon became not a luxury of life, but a necessity. And in the Empire of Austria, in some of the Northern provinces of which it was extensively manufactured, a lamp had been invented in which the oil burned with a beautiful clear flame, and without smoke. The light could also be carried about indifferently without extinguishing. Here was the great desideratum at last, the greatest obstacle overcome. This lamp was promptly introduced into the United States. Our government has issued innumerable patents for improvements in this lamp. The quality of our light has been greatly improved, but it is less the result of any improvement in the lamp than a more perfect method of refining the oil.

When Mr. Young began the manufacture of mineral oil, the success of his efforts sent consternation into some branches of industry on this side of the Atlantic.

The great manufacturers of animal oils along our eastern seaboard were first to take the alarm. For years they had almost monopolized the whale fisheries, and large amounts of capital were invested in the production of the smaller fish oils and lard oil. They saw in his success the breaking down of their monopoly, the destruction of their trade; and, determined to preserve their importance, they commenced manufacturing mineral oils themselves. Casting about for the means of self-preservation, they very soon discovered that our own country afforded even greater facilities for the production of these commodities than either Great Britain or any other part of Europe.

Our bituminous coal measures were found to be the most extensive and accessible in the world. Upon examination, valuable oil-producing shales were discovered. Mines could be obtained on the most reasonable terms; could often be purchased in fee for a few dollars per acre. Everything was favorable, and it seemed as if our prestige in oil was not only to be maintained, but vastly increased.

The great difficulty was the cost of labor, which was four times as great as in England, and nearly six times greater than in Germany, where much of the work was done by women. This, to be sure, was in some measure compensated by the difference in the cost of lands; but it was a compensation which must soon have been overcome.

Eastern capitalists invested largely in the coal lands of Virginia, Kentucky and Missouri, and to obviate the expense of transporting the coal by rail, began the erection of oil works at the mines.

Near Boston, Mass., Samuel Downer had erected works on a most extensive scale, which cost about half a million dollars, while at Portland he had other works put up at an expense of $250,000 for the manufacture of oil from imported coal; and they continued to increase, till at the time oil was struck there were not less than fifty or sixty of these establishments in the United States, one of which was in Portland, one in New Bedford, four in Boston, one in Hartford, five in the environs of New York, eight or ten in Western Pennsylvania, twenty-five in Ohio, eight in Virginia, six in Kentucky, and one in St. Louis. Many, if not most of these were of small capacity, however, and the greater part of them were not more than fairly started when the discovery of petroleum prostrated the whole business, and threatened its projectors with overwhelming loss, from which they were happily rescued by converting their oil factories into refineries, which was done with very little trouble.

Joshua Merrill, manufacturing chemist of the Downer Kerosene Oil Company of Boston, Mass., was the real discoverer of Kerosene Refined Oil and its by-products.

While the object of this history has been to show the gradual steps by which the economic value of petroleum was discovered, or rather demonstrated, and while the reader will, I presume, believe with me, that, had its value not been thus conclusively determined, and had not the way for its reception at home and abroad been opened by the previous extensive introduction of coal oil both as a lubricator and an illuminator, its development must have been indefinitely delayed; for it was a belief in its identity—for practical purposes—with coal oil that prompted the series of investigations which resulted in its most wonderful development.

The event which finally determined its economic value, which proved its identities with and differences from, coal oil, which showed that, while for many purposes it was about the same—for most purposes it was superior, was the exhaustive analysis procured and paid for by George H. Bissel and others, the report of which is appended to this history rather than place it in the chronological order to be observed throughout this work.

MESSRS. EVELETH, BISSELL & REED,

Gentlemen:—

I herewith offer you the results of my somewhat extended researches upon the Rock Oil, or Petroleum, from Venango County, Pennsylvania, which you have requested me to examine with reference to its value for economical purposes.

Numerous localities, well known in different parts of the world, furnish an oily fluid exuding from the surface of the earth, sometimes alone in "tar springs," as they are called in the western United States; frequently it is found floating upon the surface of water in a thin film, with rainbow colors, or in dark globules, that may, by mechanical means, be separated from the fluid on which it swims.

In some places wells are sunk for the purpose of accumulating the product in a situation convenient for collection by pumping the water out. The oil exudes

on the shores of lakes and lagoons, or rises from springs beneath the beds of rivers. Such are the springs of Baku, in Persia, and the wells of Amiano, in the duchy of Parma, in Italy. The usual geological position of the rocks furnishing this natural product is in the coal measures—but it is by no means confined to this group of rocks, since it has been found in deposits much more recent, and also in those that are older—but in whatever deposits it may occur, it is uniformly regarded as a product of animal, mineral, marine and vegetable composition. Whether this decomposition has been effected by fermentation only, or by the aid of elevated temperature, and distilled by heated vapor, is perhaps hardly settled.

It is interesting, however, in this connection to remember that the distillation, at an elevated temperature, of certain black bituminous shales in England and France, has furnished large quantities of an oil having many points of resemblance with Naphtha, the name given to this colorless oil, which is the usual product of distilling Petroleum. The very high boiling point of most of the products of the distillation of the Rock Oil from Venango County, Pa., would seem to indicate that it was a pyrogenic (fire-produced) product.

Bitumen, Asphaltum, Mineral Pitch, Chapapote, &c., &c., are names variously given to the more or less hard, black resinous substance which is produced usually from the exposure of Petroleum to the air, and is found either with or without the fluid Naphtha or Petroleum. The most remarkable examples of the occurrence of these substances, so intimately connected with the history of Rock Oil, are the Lake Asphaltites of the Dead Sea, so memorable in history, the well-known Bitumen Lake of Trinidad, and the deposits of mineral pitch or Chapapote in Cuba. In one of the provinces of India, vast quantities of Petroleum are annually produced, the chief consumption being local, for fuel and lights, but a portion is also exported to Europe for the production of Naphtha. In the United States, many points on the Ohio and its tributaries are noted as producing this oil; nearly all of them within the coal measures. A detailed history of these various localities can be found recorded in books of science, and their repetition here would be out of place.

General Character of the Crude Product.

The crude oil, as it is gathered on your lands, has a dark brown color, which, by reflected light, is greenish or bluish. It is thick even in warm weather—about as thick as thin molasses. In very cold weather it is somewhat more stiff, but can always be poured from a bottle even at 15 degrees below zero. Its odor is strong and peculiar, and recalls to those who are familiar with it the smell of Bitumen and Naphtha. Exposed for a long time to the air, it does not thicken or form a skin on its surface, and, in no sense, can it be called a drying oil. The density of the crude oil is .882, water being 1.000. It boils only at a very high temperature, and yet it begins to give off a vapor at a temperature not greatly above that of boiling water. It takes fire with some difficulty, and burns with an abundant smoky flame. It stains paper with the appearance of ordinary fat oils, and feels smooth and greasy between the fingers. It is frequently used in its crude state to lubricate coarse machinery. In chemical characters, it is entirely unlike the fat oils. Most of these characters are common to Petroleum from various places. In one important respect, however, the product of your lands differs from that obtained in other situations, that is, it does not, by continued exposure to the air, become hard and resinous like mineral pitch or bitumen. I have been informed by those who have visited the locality, that on the surface of the earth above the springs which furnish your oil, there is no crust or deposit of this sort such as I have seen in other situations where Petroleum or mineral tar is flowing. This difference will be seen to be of considerable importance, as it is understood and represented that this product exists in great abundance upon your property, that it can be gathered wherever a well is sunk in the soil, over a great number of acres, and that it is unfailing in its yield from year to year. The question naturally arises, of what value is it in the arts, and for what uses can it be employed? These researches answer these inquiries.

Examination of the Oil.

To determine what products might be obtained in the oil, a portion of it was submitted to fractional distillation. (Fractional distillation is a process intended to separate various products in mixture, and having unlike boiling points, by keeping the mixture contained in an alembic at regulated successive stages of temperature as long as there is any distillate at a given point, and then raising the heat to another degree, &c.) The temperature of the fluid was constantly regulated by a thermometer, the heat being applied first by a water bath, and then by a bath of linseed oil. This experiment was founded upon the belief that the crude product contained several distinct oils, having different boiling points. The quantity of material used in this experiment was 304 grammes. The thermometer indicated the degrees of the Centigrade scale, but, for convenience, the corresponding degrees of Fahrenheit's scale are added. The water bath failed to distil any portion of the oil at 100 degrees C. (—212 degrees Fah.) only a small quantity of acid water came over An oil bath, linseed oil, was then substituted, and the temperature was regularly raised by slow degrees until distillation commenced. From that point the heat was successively raised by stages of ten degrees, allowing full time at each stage for complete distillation of all that would rise at that temperature before advancing to the next stage. The results of this tedious process are given in the annexed table—304 Grammes of crude oil, submitted to fractional distillation gave:

	TEMPERATURE				QUANTITY	
1st Prod.	at 100° C.	=213° Fah.	(acid water)		5	Gms.
2d "	at 140° C.	to 150° C.	=284° to 302°	Fah.	26	"
3d "	at 150° C.	to 160° C.	=302° to 320°	Fah.	29	"
4th "	at 160° C.	to 170° C.	=320° to 388°	Fah.	38	"
5th "	at 170° C.	to 180° C.	=338° to 367°	Fah.	17	"
6th "	at 180° C.	to 200° C.	=356° to 392°	Fah.	16	"
7th "	at 200° C.	to 220° C.	=392° to 428°	Fah.	17	"
8th "	at 220° C.	to 270° C.	=428° to 518°	Fah.	12	"

Whole quantity distilled by this method	160
Leaving residue in the retort	144
Original quantity	304

Product No. 1, as above remarked, was almost entirely water, with a few drops of colorless oil, having an odor similar to the original fluid, but less intense.

Product No. 2 was an oil perfectly colorless, very thin and limpid, and having an exceedingly persistent odor, similar to the crude oil, but less intense.

Product No. 3 was tinged slightly yellow, perfectly transparent, and apparently as limpid as the second product, with the same odor.

Product No. 4 was more delicately yellowish than the last, but was in no other respect distinguishable from it.

Product No. 5 was more highly colored, thicker in consistence, and had a decided empyreumatic odor.

Product No. 6. This and the two subsequent products were each more highly colored and denser than the preceding. The last product had the color and consistency of honey, and the odor was less penetrating than that of the preceding oils. The mass of crude product remaining in the retort (equal 47.4 per cent.), was a dark, thick, resinous-looking varnish, which was so stiff when cold, that it could be inverted without spilling. This showed no disposition to harden or skin over by exposure to the air. The distillation was arrested at this point in glass, by our having reached the limit of temperature for a bath of linseed oil. The *density* of the several products of this distillation shows a progressive increase, thus:

No. 2	density	.733
No. 3	"	.752
No. 4	"	.766
No. 5	"	.776
No. 6	"	.800
No. 7	"	.848
No. 8	"	.854

To form an idea of the comparative density of these several products, it may be well to state that Sulphuric Ether, which is one of the lightest fluids known, has a density of .736, and Alcohol, when absolutely pure, .800.

The *boiling points* of these several fluids present some anomalies, but are usually progressive, thus, No. 2 gave signs of boiling at 115 degrees C. (equals 239 degrees Fah.) and boiled vigorously and remained constant at 225 degrees C. to 228 degrees C. (equals 437 degrees to 442 degrees Fah.) No. 3 began to boil at 120 degrees C. (equals 428 degrees Fah.), rose to 270 degrees (equals 518 degrees Fah.), where it remained constant. No. 4 began to vaporize at 140 degrees (equals 284 degrees Fah.), rose to 290 degrees (equals 554 degrees Fah.), where it remained constant. On a second heating the temperature continued to rise, and passed 305 degrees (equals 581 Fah.) No. 5 gave appearance of boiling at 160 degrees (equals 320 Fah.), boiling more vigorously as the heat was raised, and was still rising at 308 degrees (equals 581 Fah.) No. 6 commenced boiling at 135 degrees (equals 275 degrees Fah.), boiled violently at 160 degrees (equals 320 Fah.), and continued rising above the range of the mercurial thermometer. No. 7 commenced ebullition at the same temperature as No. 6, and rose to 305 degrees (equals 581 Fah.), where the ebullition was not very active. Much time was consumed in obtaining these results. We infer from them that the Rock Oil is a mixture of numerous compounds, all having essentially the same chemical constitution, but differing in density and boiling points, and capable of separation from each other, by a well-regulated heat.

The uncertainty of the boiling points indicates that the products obtained at the temperatures named above, were still mixtures of others, and the question forces itself upon us, whether these several oils are to be regarded as *educts* (*i. e.*, bodies previously existing, and simply separated in the process of distillation), or whether they are not rather produced by the heat and chemical change in the process of distillation. The continued application of an elevated temperature alone is sufficient to effect changes in the constitution of many organic products, evolving new bodies not before existing in the original substance.

Properties of the Distilled Oils.

Exposed to the severest cold of the past winter, all the oils obtained in this distillation remained fluid. Only the last two or three appeared at all stiffened by a cold of 15 degrees below zero, while the first three or four products of distillation retained a perfect degree of fluidity. Exposed to air, as I have said, they suffer no change. The chemical examination of these oils showed that they were all composed of Carbon and Hydrogen, and probably have these elements in the same numerical relation. When first distilled, they all had an acid reaction, due to the presence of a small quantity of free sulphuric acid, derived from the crude oil. This was entirely removed by a weak alkaline water, and even by boiling on pure water. Clean copper remained untarnished in the oil which had thus been prepared, showing its fitness for lubrication, so far as absence of corrosive quality is concerned. The oils contain no oxygen, as is clearly shown by the fact that clean potassium remains bright in them. Strong *Sulphuric Acid* decomposes and destroys the oil entirely. *Nitric Acid* changes it to a yellow, oily fluid, similar to the changes produced by Nitric Acid on other oils. *Hydrochloric, Chromic* and *Acetic Acids* do not affect it. *Letharge* and other metallic oxyds do not change it, or convert it in any degree to a drying oil. *Potassium* remains in it unaffected, even at a high temperature. *Hydrates of Potash, Soda* and *Lime* are also without action upon it. *Chloride of Calcium* and many other salts manifest an equal indifference to it.

Distilled with *Bleaching Powders* (chloride of lime) and water, in the manner of producing chloroform, the oil is changed into a product having an odor and taste resembling chloroform. Exposed for many days in an open vessel, at a regulated heat below 212 degrees, the oil gradually rises in vapor, as may be seen by its staining the paper used to cover the vessel from dust, and also by its sensible diminution. Six or eight fluid ounces, exposed in this manner in a metallic vessel for six weeks or more, the heat never exceeding 200 degrees, gradually and slowly diminished, grew yellow, and finally left a small residue of dark brown lustrous-looking resin, or pitchy substance, which in the cold was hard and brittle. The samples of oil employed were very nearly colorless. This is remarkable when we remember that the temperature of the distillation was above 500 degrees Fah. The oil is nearly insoluble in pure alcohol, not more than 4 or 5 per centum being dissolved by this agent. In ether the oil dissolves completely, and on gentle heating is left unchanged by the evaporation of the ether. India Rubber is dissolved by the distilled oil to a pasty mass, forming a thick black fluid which, after a short time, deposits the india rubber. It dissolved a little amber, but *only* sufficient to color the oil red. It also dissolves a small portion of copal in its natural state, but after roasting, the copal dissolves in it as it does in other oils.

Use for Gas Making.

The Crude Oil was tried as a means of illumination. For this purpose, a weighed quantity was decomposed, by passing it through a wrought iron retort filled with carbon, and ignited to full redness. The products of this decomposition were received in a suitable apparatus. It produced nearly pure carburetted hydrogen gas, the most highly illuminating of all the carbon gases. In fact, the oil may be regarded as chemically identical with illuminating gas in a liquid form. The gas produced equalled ten cubic feet to the pound of oil. It burned with an intense flame, smoking in the ordinary gas jet, but furnishing the most perfect flame with the Argand burner.

These experiments were not prosecuted further, because it was assumed that other products, now known and in use, for gas-making, might be employed at less expense for this purpose, than your oil. Nevertheless, this branch of inquiry may be worthy of further attention.

Distillation at a Higher Temperature.

The results of the distillation at a regulated temperature in glass led us to believe that in a metallic vessel, capable of enduring a high degree of heat, we might obtain a much larger proportion of valuable products. A copper still, holding five or six gallons, was therefore provided, and furnished with an opening, through which a thermometer could be introduced into the interior of the vessel. Fourteen imperial quarts (or, by weight, 560 ounces) of the crude product were placed in this vessel, and the heat raised rapidly to about 280 degrees C. (equals 536 degrees Fah.), somewhat higher than the last temperature reached in the first distillation. At this high temperature, the distillation was somewhat rapid, and the product was easily condensed without a worm. The product of the first stage was 130 ounces (or over 28 per cent.), of a very light-colored thin oil, having a density of .792. This product was also acid, and, as before, the acid was easily removed by boiling with fresh water. The temperature was now raised to somewhat above 300 degrees C. (equals 572 degrees Fah.), and 123 ounces more distilled, of a more viscid and yellowish oil, having a density of .865. This accounts for over 43 per cent. of the whole quantity taken. The temperature being raised now above the boiling point of mercury, was continued at that until 170 ounces, or over 31 per cent., of a dark brown oil had been distilled, having a strong empyreumatic odor. Upon standing still for some time, a dark blackish sediment was seen to settle from this portion, and on boiling it with water, the unpleasant odor was in a great degree removed, and the fluid became more light-colored and perfectly bright. (It was on a sample of this that the photometric experiments were made.) The next portion, distilled at about 700 degrees Fah., gave but about 17 ounces, and this product was both lighter in color and more fluid than the last. It now became necessary to employ dry hickory wood as a fuel, to obtain flame and sufficient heat to drive over any further portions of the residue remaining in the alembic.

It will be seen that we have already accounted for over 75 per cent. of the whole quantity taken. There was a loss on the whole process of about 10 per cent., made up, in part, of a coaly residue that remained in the alembic, and partly of the unavoidable loss resulting from the necessity of removing the oil twice from the alembic, during the process of distillation, in order to change the arrangements of the thermometer, and provide means of measuring a heat higher than that originally contemplated.

About 15 per cent. of a very thick, dark oil completed this experiment. This last product, which came off slowly at about 750 degrees Fah., is thicker and darker than the original oil, and when cold is filled with a dense mass of pearly crystals. These are Paraffine, a peculiar product of the destructive distillation of many bodies in the organic kingdom. This substance may be separated, and obtained as a white body, resembling fine spermaceti, and from it beautiful candles have been made. The oil in which the crystals float is of a very dark color, and by reflected light is blackish green, like the original crude product. Although it distills at so high a temperature, it boils at a point not very different from the denser products of the first distillation. The Paraffine, with which this portion of the oil abounds, does not exist ready-formed in the original crude product; but it is a result of the high temperature employed in the process of distillation, by which the elements are newly arranged.

I am not prepared to say, without further investigation, that it would be desirable for the company to manufacture this product in a pure state, fit for producing candles (a somewhat elaborate chemical process); but I may add that, should it be desirable to do so, the quantity of this substance produced may prob-

ably be very largely increased by means which it is now unnecessary to mention.

Paraffine derives its name from the unalterable nature of the substance, under the most powerful chemical agents. It is white, in brilliant scales of a greasy lustre; it melts at about 116 degrees, and boils at over 700 degrees Fah.; it dissolves in boiling alcohol and ether, and burns in the air with a brilliant flame. Associated with Paraffine are portions of a very volatile oil, *Eupione,* which boils at a lower temperature, and by its presence renders the boiling point of the mixture difficult to determine. I consider this point worthy of further examination than I have been able at present to give it, *i. e.* whether the last third, and possibly the last half, of the Petroleum, may not be advantageously so treated as to produce from it the largest amount of Paraffine which it is able to produce.

The result of this graduated distillation, at a high temperature, is that we have obtained over 90 per cent. of the whole crude product in a series of oils, having valuable properties, although not all equally fitted for illumination and lubrication.

A second distillation of a portion of the product which came over in the latter stages of the process (a portion distilled at about 650 degrees Fah., and having a high color), gave us a thin oil of density about .750, of light yellow color and faint odor.

It is safe to add that, by the original distillation, about 50 per cent. of the crude oil is obtained in a state fit for use as an illuminator without further preparation than simple clarification by boiling a short time with water.

Distillation by High Steam.

Bearing in mind that by aid of high steam, at an elevated temperature, many distillations in the arts are effected which cannot be so well accomplished by dry heat, I thought to apply this method in case of the present research. Instances of this mode of distillation are in the new process for Stearine candles, and in the preparation of Rosin Oil. I accordingly arranged my retort in such a manner that I could admit a jet of high steam into the boiler, and almost at the bottom it contained Petroleum. I was, however, unable to command a jet of steam above 275 degrees to 290 degrees Fah., and, although this produced abundant distillation, it did not effect a separation of the several products, and the fluid distilled had much the same appearance as the Petroleum itself, thick and turbid. As this trial was made late in the investigation, I have been unable to give it a satisfactory issue, chiefly for want of steam of a proper temperature. But I suggest, for the consideration of the company, the propriety of availing themselves of the experience already existing on this subject, and particularly among those who are concerned in the distillation of Rosin Oil —a product having many analogies with Petroleum in respect to its manufacture.

Use for the Naphtha for Illumination.

Many fruitless experiments have been made in the course of this investigation which it is needless to recount. I will, therefore, only state those results which are of value.

1. I have found that the only lamp in which this oil can be successfully burned is the Camphene lamp, or one having a button to form the flame, and an external cone to direct the current of air, as is now usual in all lamps designed to burn either Camphene, Rosin Oil, Sylvic Oil, or any other similar product.

2. As the distilled products of Petroleum are nearly or quite insoluble in alcohol, burning fluid (*i. e.*, a solution of the oil in alcohol) cannot be manufactured from it.

3. As a consequence, the oil cannot be burned in a hand lamp, since, with an unprotected wick, it smokes badly. Neither can it be burned in a Carcel's mechanical lamp, because a portion of the oil being more volatile than the rest, rises in vapor on the elevated wick required in that lamp, and so causes it to smoke.

I have found all the products of distillation from the copper still capable of burning well in the Camphene lamp, except the last third or fourth part (*i. e.*, that portion which came off at 700 degrees Fah. and rising, and which was thick with the crystals of Paraffine). Freed from acidity by boiling on water, the oils of this distillation burned for twelve hours without injuriously coating the wick, and without smoke. The wick may be elevated considerably above the level required for Camphene, without any danger of smoking, and the oil shows no signs of crusting the wick tubes with a coating of Rosin, such as happens in the case of Camphene, and occasions so much inconvenience. The light from the rectified Naphtha is pure and white without odor. The rate of consumption is less than half that of Camphene or Rosin Oil. The Imperial pint, of 20 fluid ounces, was the one employed —a gallon contains 160 such ounces. A Camphene lamp, with a wick one inch thick, consumed of rectified Naphtha in one hour 1¾ ounces of fluid. A Carcel's mechanical lamp of ⅞-inch wick, consumed of best Sperm Oil, per hour 2 ounces. A "Diamond Light" lamp, with "Sylvic Oil," and a wick 1½ inches in diameter, consumed, per hour, 4 ounces.

I have submitted the lamp burning Petroleum to the inspection of the most experienced lampists who were accessible to me, and their testimony was that the lamp burning this fluid gave as much light as any which they had seen, that the oil spent more economically, and the uniformity of the light was greater than in Camphene, burning for twelve hours without a sensible diminution, and without smoke. I was, however, anxious to test the amount of light given, more accurately than could be done by a comparison of opinions. With your approbation I proceeded therefore to have constructed a *photometer,* or apparatus for the measurement of light, upon an improved plan. Messrs. Grunow, scientific artists of this city, undertook to construct this apparatus, and have done so to my entire satisfaction. This apparatus I shall describe elsewhere—its results only are interesting here. By its means I have brought the Petroleum light into rigid comparison with the most important means of artificial illumination. Let us briefly recapitulate the results of these

Photometric Experiments.

The *unit* adopted for comparison of intensities of illumination is Judd's Patent Sixes Sperm Candle.

The Sperm Oil used was from Edward Mott Robinson, of New Bedford—the best winter Sperm remaining fluid at 32 degrees Fah. The Colza Oil and Carcel's lamps were furnished by Dardonville, lampist, Broadway, New York. The Gas used was that of the New Haven Gas Light Company., made from best Newcastle coal, and of fair average quality.

The distance between the standard candle, and the illuminator sought to be determined was constantly 150 inches—the Photometer traversed the graduated bar in such a manner as to read, at any point where the equality of illumination was produced, the ratio between the two lights. I quote only single examples of the average results, and with as little detail as possible, but I should state that the operation of the Photometer was so satisfactory that we obtained constantly the same figures when operating in the same way, evening after evening, and the sensitiveness of the instrument was such that a difference of one-half inch in its position was immediately detected in the comparative illumination of the two equal discs of light in the dark chamber. This is, I believe, a degree of accuracy not before obtained by a Photometer.

Table of illuminating power of various artificial lights compared with Judd's patent candles as a unit:

Source of Light.	Ratio to Candle.—1.
Gas burning in Scotch fish-tail tips, 4 feet to the hour	1:5.4
Gas burning in Scotch fish-tail tips, 6 feet to the hour	1:7.55
Gas burning in Cornelius fish-tail tips, 6 feet to the hour	1:6.3
Gas burning in English Argand burner, 10 feet to the hour	1:16.
Rock Oil, burning in 1-inch wick Camphene Lamp, consuming 1¾ ounces of fluid to the hour	1:8.1
Carcel's Mechanical Lamp, burning best Sperm Oil, 2 ounces of fluid to the hour, wick ⅞ of an inch	1:7.5
Carcel's Mechanical Lamp, burning best Sperm Oil, 2 ounces of Colza Oil	1:7.5
Camphene Lamp (same size as Rock Oil above), burning best Camphene, 4 fluid ounces per hour	1:11.
"Diamond Light" by "Sylvic Oil," in 1½-inch wick, 4 ounces per hour	1:8.1

From this table it will be seen that the Rock Oil Lamp was somewhat superior in illuminating power to Carcel's Lamp of the same size, burning the most costly of all oils. It was also equal to the "Diamond Light" from a lamp of one-half greater power, and consequently is superior to it in the same ratio in lamps of equal power. The camphene lamp appears to be about one-fifth superior to it, but, on the other hand, the Rock Oil surpasses the Camphene by more than one-half in economy of consumption (*i. e.,* it does not consume one-half so much fluid by measure), and it burns more constantly. Compared with the Sylvic Oil and the Sperm, the Rock Oil gave on the ground glass diaphragm the whitest discs of illumination, while in turn the Camphene was whiter than the Rock Oil light. By the use of screens of different colored glass all inequalities of *color* were compensated in the use of the Photometer, so that the intensity of light could be more accurately compared. Compared with Gas, the Rock Oil gave more light than any burner used except the costly Argand consuming ten feet of gas per hour. To compare the *cost* of these several fluids with each other, we know the price of the several articles, and this varies very much in different places. Thus, gas in New Haven costs $4 per 1,000 feet, and in New York $3.50 per 1,000, in Philadelphia $2.00 per 1,000 and in Boston about the same amount.

Such Sperm Oil as we used costs $2.50 per gallon, the Colza about $2.00, the Sylvic Oil 50 cents, and the Camphene 68 cents—no price has been fixed upon for the rectified Rock Oil.

I cannot refrain from expressing my satisfaction at the results of these photometric experiments, since they have given the Oil of your Company a much higher value as an illuminator than I had dared to hope.

Use of the Rock Oil as a Lubricator for Machinery.

A portion of the rectified oil was sent to Boston to be tested upon a trial apparatus there, but I regret to say that the results have not been communicated to me yet. As this oil does not gum or become acid or rancid by exposure, it possesses in that, as well as in its wonderful resistance to extreme cold, important qualities for a lubricator.

Conclusion.

In conclusion, gentlemen, it appears to me that there is much ground for encouragement in the belief that your company have in their possession a raw material from which, by simple and not expensive process, they may manufacture very valuable products.

It is worthy of note that my experiments prove that nearly the *whole* of the raw product may be manufactured without waste, and this solely by a well directed process which is in practice one of the most simple of all chemical processes.

There are suggestions of a practical nature, as to the economy of your manufacture, when you are ready to begin operations, which I shall be happy to make, should the company require it—meanwhile, I remain, gentlemen,

Your obedient servant,

B. SILLIMAN, JR.,

Professor of Chemistry in Yale College.

NEW HAVEN, APRIL 16, 1855.

Benjamin Silliman, Jr., an American chemist, born in New Haven, Conn., December 4, 1816, graduated at Yale College in 1837 and became assistant to his father, Benjamin Silliman, Sr., the first Professor of Chemistry at Yale College, 1802-1853. Young Silliman succeeded his father and held the position of chemistry at Yale College until he died. The day of his death was June 14, 1885.

EARLY AND INTERESTING FACTS.

We now approach that interesting period in the history of Petroleum in America which witnessed the first



movement toward a practical development of its astounding resources.

The reader who has carefully scanned the report to Mr. Bissell and others will have observed that, however it may have been with himself, the existence of Petroleum was not a novelty to scientific minds.

While he will perceive with admiration the completeness and comprehensiveness with which every phase of the subject was examined, and reflect with astonishment upon the manner in which every mode of treatment was foreshadowed, it cannot fail to strike the reader as remarkable that, notwithstanding the value of this product to our country has been about $3,200,000,000; notwithstanding forty-five years have elapsed since the first well was drilled, and the total number of wells since drilled to obtain it must reach 211,573. We shall now follow up the history of that development, which has since proved to be of so great importance to the prosperity of the country, and the comfort and convenience of mankind.

Bearing in mind the frequent appearance of Petroleum in the salt wells of the Kanawha valley in West Virginia, and along the valley of the Ohio near the mouth of the Muskingum, the reader will not be surprised to hear of its appearance in the salt wells of Tarentum, on the Allegheny river, twenty miles above Pittsburg, Pa. But its appearance at this place was singular, in so far that instead of appearing where the wells were first sunk, many of them were successfully pumped for brine for a long time before the manifestations of oil disturbed operations. Mr. S. M. Kier, who together with his father was a large owner in these salt works, stated that one well on the left bank of the river, after having been pumped constantly for twenty years without a show of Petroleum, passed to new owners, who rigged it up with a new engine of greater power, and in a few days it began to yield four or five barrels of oil per day.

The wells on the other side of the river owned by S. M. Kier and his father had for years previous yielded a small quantity of Petroleum, which, being suffered to waste for a long time, spread itself over the surface of the old canal, and became accidentally ignited, when it came so near causing the destruction of a large amount of property, as well as endangering human life, that it was afterwards poured upon the ground.

About the year 1849, Mr. S. M. Kier, Jr., conceived the thought of putting it up in bottles and selling it as a specific remedy for all the ills of life. He opened an establishment in Pittsburg, where it was put up in half-pint bottles, which were wrapped in the following descriptive sheet, and sold for a half-dollar apiece:

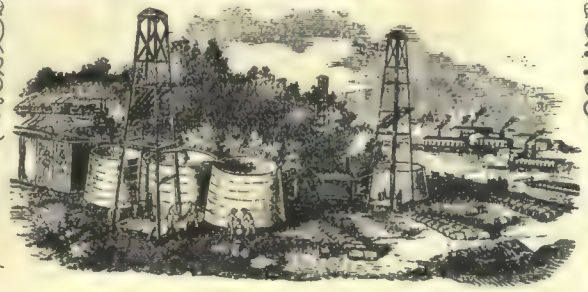
400

A. D.

1848

DISCOVERED IN BORING FOR SALT WATER

near



A. D.

1849

Wonderful MEDICAL VIRTUES DISCOVERED.

400



THE Bank of the Allegheny River, IN

ALLEGHENY COUNTY, PENNS'A.

about **FOUR HUNDRED FEET** *below*

the Earth's surface, is pumped up with the Salt Water, flows into the Cystern, floats on top, when a quantity accumulates, is drawn off into Barrels, is bottled in its natural state without any preparation or admixture. For particulars, get a Circular.



400

400

Pittsburgh,

Jan. 1st, 1852.

400

S. M. Kier,

Proprietor.

KIER'S

PETROLEUM, OR ROCK OIL, CELEBRATED FOR ITS WONDERFUL CURATIVE POWERS. A NATURAL REMEDY! PROCURED FROM A WELL IN ALLEGHENY COUNTY, PA., FOUR HUNDRED FEET BELOW THE EARTH'S SURFACE. PUT UP AND SOLD BY SAMUEL M. KIER, 363 LIBERTY STREET, PITTSBURG, PENN'A.

The beautiful balm, from Nature's secret spring,
The bloom of health and life, to man will bring;
As from her depths the magic liquid flows,
To calm our sufferings, and assuage our woes.

The Petroleum has been fully tested! It was placed before the public as a Remedy of Wonderful Efficacy. Every one not acquainted with its virtues, doubted its healing properties. The cry of humbug was raised against it. It had some friends—those that were cured through its wonderful agency. These spoke out in its favor. The lame, through its instrumentality, were made to walk—the blind, to see. Those who had suffered for years under the torturing pains of Rheumatism, Gout and Neuralgia, were restored to health and usefulness. Several who were blind have been made to see, the evidence of which will be placed before you. If you still have doubts, go and ask those who have been cured! Some of them live in our midst, and can answer for themselves. In writing about a medicine, we are aware that we should write Truth—that we should make no statements that cannot be proved. We have the witnesses; crowds of them, who will testify in terms stronger than we can write them, to the efficacy of this remedy; who will testify that the Petroleum has done for them what no medicine ever could before; cases that were pronounced hopeless, and beyond the reach of remedial means; cases abandoned by Physicians of unquestionable celebrity, have been made to exclaim, "This is the Most Wonderful Remedy Yet Discovered!" We will lay before you the certificates of some of the most remarkable cases: to give them all, would require more space than would be allowed by this circular. Since the introduction of the Petroleum, many Physicians have been convinced of its efficacy, and now recommend it in their practice; and we have no doubt that it will stand at the head of the list of valuable Remedies. If the Physicians do not recommend it the people will have it of themselves; for its transcendent power to heal will and must become known and appreciated; when the voices of the cured speak out; when the cures themselves stand out in bold relief, and when he who for years has suffered with the tortures and pangs of an immedicable legion, that has been shortening his days and hastening him "to the narrow house appointed for all the living," when he speaks out in its praise, who will doubt it? The Petroleum is a Natural Remedy; it is put up as it flows from the bosom of the earth, without anything being added to or taken from it.

It gets its ingredients from the beds of substances which it passes over in its secret channel. They are blended together in such a form as to defy all human competition. The Petroleum, in this respect, is like Mineral Water, whose virtues in most chronic diseases, are acknowledged, not only by Physicians, but by the community at large. These singular fluids flowing out of the earth, impregnated with medicinal substances of different properties, and holding them in such complete solution as to require the aid of Chemistry in order to detect them, bear ample proof to the fact that they are compounded by the master hand of Nature, for the alleviation of human suffering and disease. If Petroleum is medicine at all, it is a good one, for Nature never half does her work; and that it is a medicine of unequalled power we have the most abundant testimony. It will be used when many of the new remedies now in vogue will have been forgotten forever. It will continue to be used and applied as a Remedy as long as man continues to be afflicted with disease. That it will cure every disease to which we are liable, we do not pretend; but that it will cure a great many diseases hitherto incurable, is a fact which is proved by the evidence in its favor. Its discovery is a new era in medicine, and will inure to the health and happiness of man.

All of which was followed by about a hundred testimonials of wonderful cures of hopelessly incurable diseases.

In fact, after the manner of patent medicines in our own day, it was declared perfectly capable of doing or undoing whatsoever anybody could wish done or undone. It was trundled around the country by agents who traveled in vehicles decorated in gilt, with pictures of the good Samaritan ministering to a sufferer writhing in inhuman contortions under a palm tree.

Although the oil cost him next to nothing, as it was obtained from his own wells, which were pumped for salt, and for a long time he could not dispose of even the whole of the two or three barrels a day produced, yet the expense of introducing it as a medicine in this way consumed the profits. As the stuff, however, possessed considerable medicinal virtue, the demand continued to increase until quite a valuable trade was established, when he withdrew his agents and furnished it exclusively through the drug stores.

This at first left a quantity on hand, for his sales sensibly fell off for a while, after the agents were withdrawn in 1852, and having previously burned the crude oils at the wells, it occurred to him that he might utilize this surplus if he could only devise some way of rendering it less offensive, in the way of smoke and odor.

The most obvious suggestion was to distill it. This he accomplished by fitting a caldron kettle with a cover and a worm. The first result was a dark distillate, little better than the crude itself; but after he learned to manage his fires so as not to send it over too rapidly, he produced by twice distilling an article about the color of clear cider, which, like all distillates, had an odor infinitely more offensive than the crude Petroleum, and as he knew nothing of treating it with acids, as is done at the present time—as, indeed, was extensively done very shortly after that with coal oil—he seemed to be progressing very slowly toward the production of an illuminator.

After some improvement on the camphene lamp, however, he perceived with joy that his distillate would burn without smoking, provided the flame was kept low enough and the lamp left perfectly quiet. From this rude beginning, he went on improving both the

quality of his fluid and the adaptability of his lamp, thus manufacturing and selling for a dollar and a half a gallon all the Petroleum he could not dispose of as a medicine, for burning, till at last by the introduction of the "Virna burner" and the treatment of his distillate with acids he had brought the matter nearly to its present state of perfection, when the first Petroleum well in Venango County broke his monopoly and put an end to the manufacture of coal oil in the United States.

Up to the time when his first attempts to utilize Petroleum for a burning fluid, a very little of which had been collected on Oil Creek by absorption in blankets, from which it was wrung, amounting in all perhaps to a couple of barrels per month, the principal part of which was gathered from a spring which bubbled up in the middle of the creek on the Hamilton McClintock farm, three miles above Oil City.

Many writers have given very exaggerated accounts of the quantity of oil exuding from these springs, and convey to the reader the impression that the surface of the creek was an unbroken sheet of Petroleum, while the truth is, only in high water, when the freshets brought down that which had collected in the bays, was it at all noticeable.

The spring next in importance was near the northern line of the county on the lands of Brewer, Watson & Co. It was beside this spring the first artesian well was drilled for Petroleum.

The first written document looking to a mechanical development is the following between J. D. Angier, a resident of Titusville, Pa., and the firm of Brewer, Watson & Co., consisting of Ebenezer Brewer and James Ryan, of Pittsburg, and Jonathan Watson, Rexford Pierce and Elijah Newberry, of Titusville, associated in an extensive lumbering business on Oil Creek:

The Agreement.

"Agreed this fourth day of July, A. D. 1853, with J. D. Angier, of Cherrytree Township, in the county of Venango, Pa., that he shall repair up and keep in order the oil spring on land in said Cherrytree Township, or dig and make new springs, and the expenses to be deducted out of the proceeds of the oil, and the balance, if any, to be equally divided, the one-half to J. D. Angier and the other half to Brewer, Watson & Co., for the full term of five years from this date. If profitable."

BREWER, WATSON & Co.
J. D. ANGIER.

Following out the spirit of this agreement, Mr. Angier proceeded at once to erect some slight works for collecting the oil. A few rude trenches were dug, centering in a common basin from which the water was raised by a pump, connected with the saw mill of Brewer, Watson & Co., into a series of broad, shallow troughs, shelving off to the ground. Where the water passed from each trough into the next was rigged an ingenious little skimmer adjusted just under the surface of the water, so as to collect the oil.

The water passing under was again agitated by the fall which favored a further separation of the oil, which was collected as before by the skimmer at the end of the trough. In this manner three or four gallons a day were collected, and even as high as six gallons, where the ground had been recently agitated by digging, but the expense consumed the profit, and after a few months, the experiment was suffered to drop.

Mr. Angier describes a remarkable pehnomenon observed in this method of obtaining the Petroleum. While digging in the gravelly clay, three or four feet beneath the surface, the workmen frequently struck "pockets" of oil often containing a quart.

In the summer of the year 1854, Dr. F. B. Brewer, whose father was at the head of the firm of Brewer, Watson & Co., visited relatives at Hanover, New Hampshire, and carried a bottle of Petroleum to Professor Crosby, of Dartmouth College, where he had graduated some ten years before.

A few weeks later George H. Bissell, a native of the town and a graduate of the same college, but then practicing law in New York City, while on a visit to his mother, called to spend an evening with his old tutor, Professor Crosby, and was shown the Petroleum, upon the wonderful properties of which the Professor expatiated with great enthusiasm.

Coal oil was then just being introduced in the eastern states for illuminating and lubricating, and the similarity of the products naturally suggested the question why Petroleum might not be used for the same purpose. Of Mr. Kier's attempts in that direction nothing was of course known. They were upon too limited a scale to attract attention. The only doubt was as to the supply; and that was of course a serious doubt.

Coal oil was selling for a dollar a gallon, and from the glowing description which had been given of the spring by Dr. Brewer it seemed reasonable to hope that many thousand gallons might be collected annually.

Professor Crosby had a son, who was ready for any enterprise that promised a chance of making money. He seems to have been persuaded from the first that the oil spring was a humbug, but he had the penetration to see that it was a humbug of the "taking" sort; and, dilating on the representations of Dr. Brewer, he induced Mr. Bissell, on certain conditions to pay the expenses of a trip to Titusville, for the purpose of inspecting the spring. The most obvious method of handling such a piece of property for the purpose of making money was to throw it into a joint stock company.

If he brought back a favorable report of the spring, Mr. Bissell pledged himself to organize the company and launch the enterprise on the New York stock market.

Mr. Bissell authorized him to propose to the firm of Brewer, Watson & Co. the formation of a joint stock company, with a capital stock of $250,000, divided into ten thousand shares of twenty-five dollars each—Brewer, Watson & Co. to receive one-fifth of the whole stock; and five thousand dollars for the tract containing the oil spring, to be paid out of the first money realized from the sale of treasury stock, which was also to be one-fifth of the whole. Mr. Crosby was to take one-fifth, and assume one-fifth of the expense of

getting up the company, while the other two-fifths were to remunerate Mr. Bissell, and his associate in law, Mr. Jonathan G. Eveleth, for the trouble of organization.

To this Dr. Brewer, as the agent of Brewer, Watson & Co., replied in the following letter, a copy of which has been preserved and is furnished by Dr. Brewer, Jr.;

GENTLEMEN:—We have received through Mr. A. H. Crosby, your proposals to put in market in a joint stock company, certain springs yielding a peculiar oil surpassing in value any other oil now in use for burning, for lubricating machinery, and as a medicinal agent.

The springs yielding this oil are situated on Oil Creek in Venango county, near the corner of Warren and Crawford counties, and cover a large surface of territory.

The yield is abundant, and is believed to be inexhaustible. We have some simple machinery constructed at an expense of, say two hundred dollars, that yields on an average to each spring worked three gallons per day, requiring perhaps one day in a week the attention of one man, which, when estimated with regard to the percentage, will show as follows:

Capital invested, $200, int., at 10 per cent.	$20
Two months of run $20 per month	40
Total	$60

The cost of raising 1.095 gallons of oil, worth here seventy-five cents per gallon, making $821.25. Deducting expenses $60 leaves $761.25.

Now, this is only one spring, and worked very imperfectly, but actually paying an interest on $10,000.

I make these figures as they are, and have been whenever the spring has been worked, and this is no fancy thing for a stock, but an exceedingly large paying stock, and one that with proper machinery would afford a much larger percentage.

Now, your proposition, as far as it goes, is satisfactory; but it does not go far enough to guarantee to us a certain *quid pro quo* for what we have paying us now. And in asking us who will represent only one-fifth of the company to furnish the actual capital gratuitously, to the other four-fifths, for what we expect to realize on one-fifth, is not perhaps asking too much, but it would in our opinion be granting too much.

There are other parties in Pittsburg who were very solicitous to put the thing in market a year ago by purchasing our interest, but we prefer the plan you suggest if you will warrant us a certain amount for our premises; and we will propose as follows: Pay to Brewer, Watson & Co. $5,000, to be reimbursed to the stock company from the first sale of stock, or as you may deem proper in any way, and we will assign or deed to the company the right to go on and erect such machinery as the company may think proper, to procure oil on a certain one hundred acres of land known here as the Willard Farm, and embracing most of the oil territory as yet discovered, and further, all springs on our other lands adjoining, not interfering with our lumbering and farming interests.

This will give us an equivalent, or partially so, for what we furnish the company; and we wish the company to pay from the sale of stock its current expenses, whatever they may be, and by sale of stock to provide for a dividend, if thought best—such stock to have preference over all other except for the reimbursement of the purchase money. The other stock should be sold as you propose. These, gentlemen, are our views, hastily thrown together. If the general outlines meet your favor the minutia can be arranged with you in New York.

* * * * * *

After spending a few weeks with Dr. Brewer, Mr. Crosby hurried back to Hanover to report, but finding that Mr. Bissell had returned to New York he forwarded the letter, of which the above is a copy, to Mr. Eveleth, who was in Maine, and apparently not comprehending its terms he hastened after Mr. Bissell, and reported his proposition accepted. Mr. Bissell announced himself satisfied, and at once began the preliminary arrangements for organizing the company. In a gush of innocent satisfaction with the success of his negotiations Mr. Crosby telegraphed to Dr. Brewer that *his* proposition was accepted. He returned again to New Hampshire, and a few days later he wrote the following:

HANOVER, N. H., *September* 11, 1854.

MY DEAR DOCTOR:—

I intended to have written you again before leaving the city, but as I was very busy, and as the main question was settled by my telegram of the Monday previous, I concluded to wait until my return home.

I cannot now tell you exactly when we shall be ready to meet you in New York, but will write next Monday again, and shall then be able to tell you when you had better start.

The oil, I suppose, you can take with you to Erie, and ship it so that it will be in New York nearly as soon as you are, and that will be in sufficient season to offer it for exhibition, as we shall then have circulars, stock books and everything else ready to issue to a gullible public."

But this gulling of the public is not an enterprise of unmitigated interest with men who have everything to gain, and Eveleth & Bissell, having considerable to lose, objected to this scheme in so far that ten days later this embryo broker, curbing his wild ambition to surge into the stock exchange, and get up a panic with his "fancy," writes Dr. Brewer to the effect that after a "long talk" with Eveleth and Bissell it was decided to "put the thing through by daylight."

Thus vanished his bright dream of oil spring "fancy" at a premium of five hundred per cent., and his enthusiasm thenceforward continued to wane.

Shortly afterward, Dr. Brewer, empowered as the attorney of the lumbering firm, visited New York City to ratify the terms of sale and contract, but the letter which Crosby had forwarded to Mr. Eveleth having been lost in the mails, the result was a general misunderstanding.

Eveleth & Bissell suspecting that Crosby had intentionally deceived them—which was surely not the case—now refused to credit his statements as to the value of the springs, dismissed Dr. Brewer, and peremptorily

dropped the whole matter. But they had already incurred obligations to the extent of several hundred dollars for seals, certificates of stock, stock books, etc. On the eve of his departure for Titusville, they sent a line to his hotel, saying they would reconsider the matter, and inviting him to call. He did so, and an arrangement was effected on substantially the same basis as before proposed; but Crosby, who was unable to meet his portion of the expenses, was left entirely out of the bargain. The agreement to sell ratified, for their better information, it was decided that one of them should visit the locality at once, and examine the spring, and bring away a draft from which a map could be made.

The oil which had been sent on to Mr. Bissell was distributed for examination among several prominent chemists, and a week or two later he wrote the following letter, which may convey some idea of what it cost, both in time and money, to bring about the organization of the company and to procure the analysis of the Petroleum, which must be regarded as the most important step in all these negotiations, if we accept only the birth of the great fact which made development possible. Messrs. Eveleth & Bissell were young men, and, though possessed of considerable means, did not rank among the "heavy" of New York, and the whole expense of the organization and the analysis was advanced by them in one of the most stringent seasons that has ever marked the financial history of our country. It was done, too, at a sacrifice of personal convenience, which could only have been prompted by an earnest faith in the ultimate success of their enterprise —but the letter:

NEW YORK, *November* 6, 1854.

F. B. BREWER, ESQ.:—

Dear Sir: We have had to encounter many obstacles in the way of organizing our joint stock company, and shall be unable to get out our papers at the time originally proposed.

Mr. Eveleth will go on at the earliest possible period, and will then be prepared to arrange everything to our mutual satisfaction. I do not think, however, that it will be possible for Mr. Eveleth to arrive in Titusville before the 18th or 20th inst.

We have obtained our stock books, certificates of stock, signs, &c., &c., and have done everything to insure success when we fairly get under way. We have forwarded several gallons of the oil to Mr. Atwood, of Boston, an eminent chemist, and his report of the qualities of the oil and the uses to which it may be applied are very favorable. Professor Silliman, of Yale College, is giving it a thorough analysis, and he informs us that so far as he has yet tested it, he is of opinion that it contains a large proportion of benzole and naphtha, and that it will be found more valuable for purposes of application to the arts than as a medicinal, burning or lubricating fluid.

Our expense of a thorough analysis will be very heavy; but we think the money will be well spent. We send you a proof-sheet of our certificate of stock. The book will be printed of course on bank-note paper.

Let us hear from you at your earliest convenience, and believe us, Very truly yours,

EVELETH & BISSELL.

The whole cost of the analysis, including the photometrical comparison, for which a new and improved instrument was especially provided, was between eleven and twelve hundred dollars, every cent of which was advanced by these young men.

The above letter is the first that bears the seal of The Pennsylvania Rock Oil Company; but as the company came not into legal existence till nearly two months later, it was probably applied in obedience to a whim, or perhaps to give their correspondent an idea of its impression.

REAL ESTATE TRANSACTIONS ON OIL CREEK.

The first deed from Brewer, Watson & Co. bears date of November 10, 1854, and conveyed in fee simple to George H. Bissell and Jonathan G. Eveleth, of New York City, one hundred and five acres of land in Cherrytree Township, Venango County, Pennsylvania, embracing the island at the junction of Pine Creek and Oil Creek, on which a part of the works of the lumbering firm were situated. It was on this island that Mr. Angier's trenches were dug, and the first artesian well drilled for Petroleum five years afterwards. The consideration for the property mentioned in the deed was twenty-five thousand dollars, though the real consideration was but five thousand. It was thought that if the consideration should appear to be such an insignificant fraction of the capital stock it would be more difficult to dispose of the shares, and therefore, as is usually done in the formation of joint stock companies, the land was put in at a figure far above its cost. The deed, though dated on the 10th of November, was not formally executed till the first of January following, for the reason that Messrs. Eveleth and Bissell had opened negotiations with a party of gentlemen in New Haven, under whose notice the matter had been brought by Professor Silliman, who evinced an inclination to subscribe for a large portion of the stock, and in case they did, it was proposed to place one or more of their number on the board of directors, and have the property conveyed directly from Brewer, Watson & Co. to The Pennsylvania Rock Oil Company. But this failing, Eveleth and Bissell gave their joint and several notes for the purchase money, save five hundred dollars paid in cash, and on the first day of January, 1855, the deed was executed by the members of the firm living in Titusville, and four days afterwards by the remaining members in Pittsburg. It was asserted in a paper on this subject which appeared in the *Atlantic Monthly*, for 1869, that Dr. Brewer never received pay for the land, which is quite untrue; for, though Dr. Brewer never had anything to do with the land except in the capacity of agent for his father and the other members of the firm, the notes he received were certainly paid for; they were all found cancelled, and with payment indorsed, among papers submitted by Mr. Bissell. This may seem a matter of trifling interest in the history of the vast industry born of these transactions, but as well as being a piece of personal injustice, it is a palpable absurdity, for Mr. Bissell afterwards acquired, and retained, an immense amount of property in the country, that would have been liable for those debts.

On the 30th of December, 1854, the following certificate of incorporation was filed, as by law required, with the Recorder of the city of New York, and also at Albany with the Secretary of State:

"Certificate of Incorporation of the Pennsylvania Rock Oil Company.

STATE OF NEW YORK,
CITY AND COUNTY OF NEW YORK, ss.

Be it known that we, the undersigned, do hereby associate ourselves as a body politic and corporate, pursuant to the N. Y. Revised Statutes, 4th edition, Vol. 1st, Chap. 18th, Art. 2d, and also Laws of New York, 1853, Chap. 333, in relation to the formation and management, powers and responsibilities of corporations.

And the following are the articles of our agreement and association:

Art. 1. The name of the corporation shall be the Pennsylvania Rock Oil Company.

Art. 2. The objects for which said Company is formed, are to raise, procure, manufacture and sell Rock Oil.

Art. 3. The capital stock of the said Company shall be two hundred and fifty thousand dollars, and shall be divided into ten thousand shares of twenty-five dollars each.

Art. 4. The business of said Company shall commence on the 1st day of January, 1855, and continue fifty years.

Art. 5. The business of said Company shall be under the management of seven trustees, and the board of trustees for the first year shall consist of the following persons, viz:

George H. Bissell, of New York; J. G. Eveleth, of New York; Franklin Reed, of New York; Francis B. Brewer, of Titusville, Pennsylvania; Anson Sheldon, of New Haven, Connecticut; James H. Salisbury, of New York; and Dexter A. Hawkins, of New York.

Art. 6. The principal place of business shall be in the city and county and State of New York.

In witness whereof we have hereunto set our hands and affixed our seals, this thirtieth day of December, Anno Domini, one thousand eight hundred and fifty-four."

Here follow the signatures of the above-mentioned seven trustees, of whom, all but Dr. Brewer, who represented the stock of Brewer, Watson & Co., were mere lay-figures, occupying positions it was necessary for appearance's sake, that some one should fill. Not more than one of them at most represented stock held in his own right, stock for which he had paid.

On the 16th of January, 1855, Eveleth and Bissell conveyed to the Trustees of The Pennsylvania Rock Oil Company all their right and title to the lands, but the deed fortunately was not recorded, and the estate continued ostensibly in them till the following autumn, when it was conveyed to other parties for the benefit of the *new* Pennsylvania Rock Oil Company.

After the organization of the company in January, an effort was made to get the stock taken at some price, but the great stringency in the money market, not less than the unusual character of the enterprise, placed the stock in the ever-dangerous category of "fancies," and prevented its being taken to any great extent in the city of New York.

Yet every effort was made; and even Crosby, then engaged as a reporter on one of the newspapers of the city, became again an agent in the enterprise. He received a few shares in acknowledgment of former services, and a few more to engage some influence he was supposed to possess by having at all times the ear of the public; but no sooner had he got his couple of hundred shares transferred to his own name on the books of the company, than, figuratively speaking, he dropped the ear of the public—which had never been a profitable ear to him—and gave his exclusive attention to the disposal of his stock.

Selling stock may be pleasant enough when one has stocks that sell, but unfortunately for his hopes, Mr. Crosby's were not of that sort.

With him, as with others, the times were hard—in fact, as is usually the case with such jovial characters, the times were especially hard in his case. He was desperate, but his desperation, instead of quickening his wits, seemed rather to cloud them; and Dr. Brewer, who frequently passed back and forth from Titusville to New York, and who was cognizant of most of their transactions and difficulties, relates how one day—it happened to be a day when the desperation of Mr. Crosby's prospects had sunk his mercurial temperament to the very lowest notch—he chanced to learn that Messrs. Eveleth and Bissell were about concluding a sale of several hundred shares of stock to a Connecticut gentleman at two dollars and a half per share; and, regarding the knowledge in the light of a special providence—a plank that would save him from being engulfed in a sea of troubles—he reached out and grasped it; in other words, he sought an interview with their client, and offered him the remnant of his own stock at fifty cents per share. The result was what any one might have foreseen—what Mr. Crosby himself could not have failed to foresee, only that he was blinded by desperation—the man knowing neither of the parties and suspecting a swindle, refused to take the stock from either, and peremptorily dropped the transaction.

The consternation of Messrs. Eveleth and Bissell, who had now expended seven or eight thousand dollars, without receiving a cent, and had calculated on this sale to help them out with their own obligations, when they learned of the transaction, and the aggravating circumstances by which that failure was brought about, may possibly be imagined, but cannot be described.

But as it was useless to offer stock for sale while Mr. Crosby had any to sell, they found it expedient to buy for themselves the little remnant of stock he found it impossible to sell to any one else, and he readily parted with it for such a meagre sum as enabled him to reach the paternal roof at Hanover! And thus forever subsided that luminary to whom it pleased the writer of the paper in the Atlantic to gushingly ascribe the development of Petroleum!

The enterprise continued to hang fire. True it is, that neither of the partners was able to give his exclusive attention to its management. Their legal busi-

ness claimed their attention, and so far there was nothing in prospect for the stock company, to encourage the thought of giving up a thrifty legal business, to assume the more active management thereof. But they engaged the services of John Sheldon, a superannuated minister from Connecticut, and kept him to fan the little flame of interest manifested by a circle of gentlemen in New Haven, who eagerly watched the progress of Professor Silliman's analysis. To say that he was not earnest in his work would be doing him injustice. He was enthusiastic. He bought several hundred shares himself, for which he gave a note that he had about as reasonable a hope of paying as the immortal Micawber, when he negotiated his paper at the Canterbury Inn, and then, poor man, he became not only an enthusiast but a fanatic.

Some two thousand shares were transferred to him to sell, and the lowest price fixed. Dreaming the same fond dreams of sudden riches that have ever been the fatality of oil stocks, he fell frantically to work. The following letter from him will throw some light on the way they were obliged to dicker in the disposal of the stock:

My Dear Sir:—

Professor Silliman has not yet completed his photometrical examination of the Rock Oil, in comparison with other burning fluids; but will probably wind up his analysis in all this week.

The experiments last evening were favorable, and are to be renewed again this evening, and continued until the work is done.

The oil will not burn well in the Carrol Mechanical Lamp, but burns finely in the camphene lamps, and will be tested in those now in general use. The value of the oil depends mostly on its properties as a burning fluid.

In this respect the analysis, in its results, has been highly satisfactory. Several gentlemen here have signified a desire to take some of the oil stocks, and pay for the same in town lots, but I have not as yet been able to satisfy my own mind as to their value and hence have not closed any negotiations. * * * * *

This difficulty in disposing of stock was not occasioned more by the complete prostration of the money market than by the laws of the State of New York, which bore heavily on such enterprises by rendering the shareholder in a joint stock company liable for its debts to the extent of the par value of the stock he owned.

During the preceding year such enormous frauds had been perpetrated by taking advantage of this law that it was even difficult to give away stocks of just as good character as theirs. It was not considered the safest investment in the world for a man having no means of knowing the financial condition of a company, except by tedious investigations, which it was not possible for every one to make, to take shares at two dollars whose par value was twenty-five, when, for aught they knew, they might be called upon any day by decree of court to pay the whole twenty-five to the company's creditors.

With the opening of spring, however, the partners took the matter more actively in hand. About the middle of April Professor Silliman's report was handed in, and after being printed was distributed wherever it was desired to obtain notice for the enterprise. On the 11th of May, writing from New Haven, their agent says:

"Silliman's report is now generally in the hands of the monied men of this place, and the impression it has created is decidedly favorable to the P. R. O. Company. But with the present state of feeling existing here in reference to joint stock companies formed under the laws of the State of New York, and doing their business in the City of New York, I do not think that any great amount of stock will be taken by capitalists in this city.

The history of the New York & New Haven Railroad, and also the Western Empire Company, is still remembered with sorrow. Many had been ruined by the frauds committed by these companies, so that by them many others had sustained losses."

Under the circumstances, it is not at all strange that monied men should be cautious. * * *

Some of the most prominent business men here have signified a desire to take stock in the Company, provided it be reorganized under the laws of Connecticut, and New Haven made the place of its business operations. In this state the property of the stockholder is not liable for the debts of the Company." * * *

From the above we may obtain a view of the situation and the difficulties that trammeled them. To begin with, they were not rich; and the cost of the land, and the expense of the analysis—including the photometrical comparison about twelve hundred dollars—together with all the innumerable smaller expenses of organization, had absorbed the greater part of their available means. The previous fall they had employed Mr. Angier to take charge of the spring, and run the rude machinery for pumping which he had himself invented and erected, and now when the spring opened, he was engaged to resume operations, while they hastened to do that which they saw must plainly be done before they could succeed—to organize a new company under the laws of Connecticut. This accomplished, a number of men promised to subscribe liberally for the stock.

Therefore a new company was formed in New Haven with a nominal capital of three hundred thousand dollars, and preparations made to take the property of the old company at twenty-four thousand dollars, and raise by immediate assessment a sufficient sum to undertake the development of the property by trenching on a large scale.

The deed to the first company had never been recorded, and it was thought the simplest course to call in all the stock—on every matter, since they owned the most of it themselves, and the rest was held principally by their agent, who, poor man, rejoiced at the thought of cancelling his obligations by returning it—and thus after extinguishing the former corporation, make the deed directly to the new company.

When everything was ready for the transfer, Mr. Bissell had occasion to visit Titusville, where he was detained over Sunday.

A drizzling rain prevented his walking out. While lounging in the parlor of the little inn of the hamlet,

he chanced to pick up a copy of the Pennsylvania Statutes, used by the Justice of the Peace, who held court in the room, and therein, to his amazement, he saw re-enacted the old English statutes of mortmain, devised and enacted three hundred years before, to check the absorption of the landed property of the realms by the several denominations of churches.

The statutes there framed for a wise and beneficent purpose were here perverted so as to render forfeit to the state of Pennsylvania the lands of any corporation organizing beyond its borders!

He hastened at once to apprise the new company of this fortunate discovery, and on the 20th of September, 1855, executed a deed to Asahel Pierpont and William A. Ives, of New Haven, who gave a bond for the value of the property and promptly *leased* it for ninety-nine years, to the new company legally formed two days before, by the publication of the following articles of association:

ARTICLES OF ASSOCIATION

OF THE PENNSYLVANIA ROCK OIL COMPANY.

Be it known that we the subscribers, do hereby associate ourselves as a body politic and corporate, pursuant to the provisions of Title 3d, Chapter 14th, of the Statute laws of the State of Connecticut, entitled "Of Joint-stock Corporations," and the act in addition thereto, and in alteration thereof, and the following are the articles of our agreement and association:

Art. 1. The name of the corporation shall be the Pennsylvania Rock Oil Company.

Art. 2. The capital stock of said corporation shall be three hundred thousand dollars, and the said capital stock shall be divided into twelve thousand shares of twenty-five dollars each.

Art. 3. The purposes for which the said corporation is established are the following, viz: to raise, procure, manufacture and sell *Rock Oil,* coal, paints, salt or any mineral or natural productions which may be found in any springs or mines, or on any lands that may come into the possession of said company by deed or lease, and generally to perform all acts and transact any business incidental to or that may be necessary in the prosecution of said business.

Art. 4. The statute aforesaid entitled "Of joint-stock companies," is hereby particularly referred to, and made part of these articles: and the corporation hereby established and organized under and pursuant to the said statute shall have the powers, and shall proceed according to the regulations described and specified in said statute.

Art. 6. The said corporation is established and located in the city of New Haven, county of New Haven and state of Connecticut.

Subscribers' Names.	No. Shares.
George H. Bissell	1,200
J. G. Eveleth	1,200
Asahel Pierpont	1,000
Prof. B. Silliman, Jr	200
Henry L. Pierpont	200
James M. Townsend	500
John Hannah	150
Ebenezer Brewer	160
William A. Ives	1,000
Brewer, Watson & Co	1,200
Edwin B. Bowditch	500
Eveleth & Bissell	4,690
	12,000

By order of the Board of Directors.

New Haven, Sept. 18, 1855.

It will thus be seen that Eveleth and Bissell retained a controlling interest in the affairs of the new company. There were, indeed, in the published articles of association, a number of other names on the list, among them John Sheldon's; but they never took their stock, and it was retained by the partners. The consideration for the land was $24,000, and, though retaining so much of the stock themselves, they had now about received the amount of their expenditure, and felt inclined to hold it and wait the result of further development of the property.

A small fund was raised for the treasury, and Mr. Pierpont, an eminent mechanic, was sent out to examine the spring with a view to the improvement of Mr. Angier's machinery. It was, however, though rude, perfectly adapted to that mode of development, and no other had been yet thought of.

Mr. Pierpont would have resumed more extensive operations, but the inharmony that forever afterwards characterized the management of this company had already begun to manifest itself, and it was found impossible to raise more money for the treasury.

While Mr. Bissell and his partner held a majority of the shares they were crippled by the by-laws to which they had subscribed, and which provided that a majority of the board of directors should be chosen from the New Haven stockholders. The one thousand shares that Mr. Ives had taken were paid for in local securities that were afterwards proven to be worthless at the time, and out of the vituperative charges that followed this discovery sprang the spirit of dissension that always thereafter divided their counsels and circumscribed their usefulness.

In a letter to Mr. Bissell in October, Dr. Brewer, speaking of a new trench, says: "Mr. Angier took six gallons from it, though it had been gathered the day before," and in a postscript to the same letter he adds: "As I have no interest in the matter only the wish to see it go on to perfection, of course I can have no object in magnifying its resources, but from fifty to one hundred gallons per day may be had by the judicious expenditure of five hundred dollars." But the five hundred dollars were not forthcoming. Even Mr. Angier's services were dispensed with.

COMMENCEMENT OF DEVELOPMENTS ON OIL CREEK.

Preoccupied by a course of specious reasoning, it is wonderful how completely the human mind may ignore the inductive logic of facts. It is a lamentable, and, apparently, an incurable frailty which more than all other human infirmities retards the progress of knowledge. It is the fault of an ancient system of specula-

tive philosophy which accepted the plausible as conclusive—which, taking anything for granted, rejected that as exceptional to the law which could not be warped to the support of its theory — a philosophy which, while it encouraged reflection, forbade experiment, and thus left much uncertain that might have been rendered positive by the simple turning over of a chip—a philosophy which received its death blow from Bacon, the experimentalist, and Franklin, his follower. But enough of its dreamy essence still lingers to tone the wild, progressive spirit of the age.

Without bringing into question here the plausibility or correctness of that theory which referred the origin of Petroleum to coal, can we help but express our wonder at the perversity of those minds, which, preoccupied with such a conclusion, steadfastly overlooked the fact that in every important case to which they could refer, it had been found very far *beneath* the coal measures?

While clinging to and reiterating a theory that was perfectly indisputable, namely: that the oil was forced to the surface by the expansibility of the gas with which it is invariably accompanied.

But a new day was dawning—a day which witnessed the birth of a new idea that gave a new direction to human thought, and developed an industry which will forever mark an era in the progress of the world.

It was the idea of obtaining Petroleum by means of artesian wells. It was a simple thought, but significant—a thought which, as Professor Silliman remarked, was the one of all others most naturally suggested by the various phenomena that had attended the discoveries of Petroleum in the salines of the Muskingum and Kanawha valleys, described in this work—the first idea that *should* have been suggested to a mind cognizant of all these circumstances; and yet, though himself editor-in-chief of the periodical in which the circumstances were described, he very candidly confessed that throughout the five months he was prosecuting the analysis, the thought of artesian drilling never once occurred to him. And yet of all in any way connected with these first transactions, he was the only one of whom we had a perfectly reasonable right to expect such an idea; but Professor Silliman's interest in the matter terminated with the conclusion of the elaborate analysis, for though he perfectly comprehended its value, he never expected to see it obtained in any great quantity, and the two hundred shares of stock he held were given him in order to make him president of the company, and thus secure the prestige of a name renowned in science.

The idea came from another quarter, and was suggested by an incident as trifling as that which disclosed the law of gravitation. While seeking shelter beneath the awning of a Broadway drug store, one scorching day in the summer of 1856, Mr. Bissell's eye fell upon a remarkable show-bill lying beside a bottle of Kier's Petroleum in the window.

His attention was arrested by the singularity of displaying a four-hundred-dollar bank note in such a place; but a closer look disclosed to him the fact that it was only an advertisement of a substance in which he was deeply interested. He stepped in and requested permission to examine it. The druggist took it from the window, and, having plenty of them, told him to keep it. For a moment he scanned it, scrutinizing the derricks and remarking the depth from which the oil was drawn, till instantly, like an inspiration, it flashed upon him that this was the way their lands must be developed—by artesian wells. It seems a very simple thought, but how astounding have been its results. It has added more than three thousand million of dollars to the material wealth of our country, and it makes our most valuable commodity of export, and throughout the world must furnish the means of subsistence to more than a million people. Its influences upon civilization are incalculable. Yet all this by the birth of a new idea. Thus, step by step the world improves, moving on toward knowledge.

The idea was simple—at first it may almost seem to have been self-evident, but reflect that the mind which grasped it must also have taken in a better conception of the philosophy of the *existence* of Petroleum than had any other mind before.

It is not unlikely that the mind of this man may have been prepared for the reception of such an idea, by long reflection. It is quite likely that Newton had seen many an apple fall before the one that gave him an idea, and it is just as unlikely that he would have ever drawn the conclusion from the incident if the necessity of the law of gravitation had not previously occurred to his mind.

When Mr. Bissell disclosed his theory to his partner that gentleman embraced it with enthusiasm, and they promptly canvassed the practicability of putting it to the test.

Their first notion was to attempt to experiment themselves, but even if they could induce the company to help them in their scheme they reflected that such a step would necessitate the loss of their legal business, and even if it should prove successful, which was all an uncertainty, they never dreamed of flowing wells that would make them millionaires in a day.

In this dilemma they imparted their convictions to Mr. Havens, of the firm of Lynn & Havens—real estate brokers on Wall street, New York—a man who had been largely identified with the construction of the first railroads in Western Pennsylvania, and he was so favorably impressed with the theory that he signified a desire to take part in the enterprise himself, and after a few days' reflection offered them five hundred dollars to secure him a lease of the property from The Pennsylvania Rock Oil Company. But that was a company very much inclined to thwart any plan proposed by the New York stockholders, and, though several of the New Haven parties, prominent among whom was Mr. Pierpont, readily accepted the new idea, they having faith—if the expression may be pardoned—and though after much delay the lease was finally granted, it was not till Mr. Havens had been overwhelmed in financial embarrassments which prevented his going on with the contract.

By the terms of the contract he was to pay the company twelve cents per gallon for all oil raised for fifteen years, and a year was given him to begin operations.

When Eveleth and Bissell conveyed their title to The Pennsylvania Rock Oil Company they reserved to the

lumbering firm the use of the mill race and the right of way over the property, in consideration for which the Oil Company received a lease to take "oil, salt, or paint" from all other lands of the firm in Venango county for a term of ninety-nine years.

But the wives of the members of the firm had not joined in the power of attorney by which the agent conveyed the lease, and would be entitled to dower in the event of the death of their husbands.

The idea of artesian drilling was too fascinating to be forgotten. It grew reasonable, upon reflection. It was sustained by all the phenomena of Petroleum. It was encouraged by every written account. It grew into such favor with the New Haven stockholders that they formed a scheme to monopolize its value.

Before the year allowed for Havens to begin operations had nearly expired, Mr. Townsend, then president of the company, in lieu of Professor Silliman, resigned, employed Mr. E. L. Drake, whom, in the darker days of its prospects, he had cajoled into purchasing two hundred dollars' worth of his own stock for the ostensible purpose of going to Titusville, to rectify the oversight mentioned in the lease, though the real object was not less to have him inspect the locality with a view to what followed, while it might be done at the expense of the company.

That this *was* their plan of operation, will be perfectly plain to any one who follows the progress of the cunning development of their scheme.

First and foremost, the legal hitch might just as easily have been fixed up by sending the documents by mail; for it was merely an oversight, and the women had no objections to signing. Then Mr. Drake, though an intelligent gentleman, was the last one to choose for the performance of legal business, as no occupation of his life had prepared him for such duty; besides, in order to give a pompous turn to the transaction in the eyes of the backwoodsmen, the legal documents, together with several letters, were mailed to "*Colonel* E. L. Drake, care of Brewer, Watson & Co.," before ever the man left New Haven.

The title was the pure invention of Mr. Townsend, who generously acknowledged his *pius fraudum,* and in the oil region and elsewhere, he has ever since been known as *Colonel* Drake. On his way to Titusville, he stopped to examine the salt borings at Syracuse, New York, and about the middle of December, 1857, was trundled into the little village of lumbermen, on the wagon that brought the mail from Erie, Pennsylvania. Prepared as they had been for his coming, he was received with ostentatious hospitality.

Finishing that part of the legal business which could be accomplished in Titusville, he spent a few days examining the various indications of oil on the lands, and then proceeded to Pittsburg, to add the signatures of Mrs. Brewer and Mrs. Rynd to the instrument of conveyance, and after visiting the wells at Tarentum, the picture of which on Mr. Kier's advertisement had suggested the idea of drilling for oil, he hurried back to New Haven, enthusiastic to conclude the scheme. On the 30th of December, the three New Haven directors, constituting a majority, executed a lease to Edwin E. Bowditch and E. L. Drake, by the terms of which they were to pay the Pennsylvania Rock Oil Company only *five and a half cents a gallon royalty* for the oil raised for fifteen years. At the annual meeting of the directors, eight days later, this lease was brought up, and, notwithstanding the protest of the two other directors, George H. Bissell and Jonathan Watson, representing a trifle over two-thirds of the whole stock, it was ostentatiously ratified. The thing, however, was so palpably unjust that Mr. Bissell and Mr. Watson withdrew, protesting, from the council. Perceiving that they had overdone the matter and might possibly lose all if they persisted, they at once changed the consideration to one-eighth, in kind, of all the "oil, salt or paint" produced, and determined to defy every protest against this. The deed was at once sent to Franklin and recorded. But, refusing to concur in terms more favorable than those granted in Havens' lease, Mr. Bissell threatened to restrain despoliation of the property by injunction, if they attempted operations. Their position was quite untenable. They knew it, and rather than undergo the scrutiny of a legal investigation, and being determined not to let the prize slip from their fingers, they yielded. A supplemental lease was recorded, making the terms the same as in Havens' lease, but extending the time to forty-five years. To this Bissell and Watson cheerfully agreed.

On the 23d of March they formed themselves into an association under the title of "The Seneca Oil Company." They had the grace to shun publicity, and the publication of the articles of association, required by law, was effected in an obscure little weekly, published in one of the villages of New Haven County, Connecticut.

The basis of their association was the lease. Mr. Drake appeared as the principal stockholder; but no stock was ever issued.

It was in effect only a partnership, the members of which sought protection against each other under the laws for joint-stock companies. From the little influence he possessed in the management of their affairs, it is evident that Drake would have furnished but little of the capital. He was not in a situation to do so. For eight or ten years previous he had been a conductor on the New York & New Haven Railroad, at a salary of seventy-five dollars per month, and the little he had been able to save from such a pittance had been swept away by an unlucky investment the year before.

He was engaged at a thousand dollars a year, and about May 1, 1858, arrived in Titusville with his family.

He had been provided by the company with a fund of a thousand dollars on which to begin operations.

His first step after getting settled was to start up the old works abandoned by The Pennsylvania Rock Oil Company, and then he cast about for a practical artesian driller to drill a well.

On the 2d of July, 1858, he writes:

"Here I am digging along yet in search of oil and other valuables. The month of May was a hard one, and the first eleven days of June, but since then we have had dry weather, so that I have got the start of

the water, and am now gathering about ten gallons of oil per day—at the same time sinking a well for the purpose of taking what oil there is on the island.

I have found some difficulty in getting a borer. All were engaged on jobs that will last until fall. Yesterday Mr. Brewer wrote me that he could get one for me at Allegheny, who will bore and tube for three dollars a foot, which is the best offer I have had. I wrote the Doctor to send him along at once. Yesterday I set some men to opening a new spring, so that things begin to look greasy."

In justice to his partners, it is due to say that Mr. Drake was well supplied with money. In the oil region there has been a general belief to the contrary, but this is entirely without foundation. In his private affairs possibly, he was embarrassed, but in his last quarterly statement to the company before striking the oil, he reported a fund of two hundred and eighty dollars on hand.

On the 16th of August, '58, he writes as follows:

"I received on Saturday at Erie, Aug. 14th, a package containing $472.67, from the Treasurer of the Seneca Oil Company, and gave the Express Company my receipt.

"I shipped two barrels of oil to Mr. Pierpont at New Haven, as he said he could make a market for it.

"In sinking our well last week we struck a large vein of oil, but the same thrust of the spade opened a vein of water that drove men out of the well, and I shall not try to dig by hand any more, as I am satisfied that boring is the cheapest. I should have had my borer here, but I wrote him on the 1st, I was not ready, as I did not know that you could raise the money, but money we must have if we make anything. I have abandoned the idea of boring and pumping by water, as I could not have the exclusive right to the power, but must be subject to the sawyer, the turner and the blacksmith, so that after consulting the best salt and oil men at Tarentum, I have contracted for an engine to be ready for boring by the first of September.

"I have got out the timber for my pump-house, and am having it framed to-day. We shall get it up this week. I shall send in a statement of my stewardship on the first of September, but if in the meantime the Company should feel too poor to furnish a thousand dollars more by the 10th of September, please let me know at once. Money is very scarce here. The lumbermen could not sell their lumber for cash this summer, and the people all depend upon the lumber trade."

The company did not send him the thousand dollars as soon as the 10th of September; his engine was not ready; and when he finally was prepared to start, the driller had taken another job and operations were suspended for the winter. In February, 1859, Drake went to Tarentum and engaged a driller to come up in April. But April came and no driller appeared, the man having been able to get a better job nearer home.

When Drake went down to look after him, Mr. Kier recommended him to engage William Smith and his two sons, who had done a great deal of work on his salt wells. About the middle of June, provided with a complete set of tools from Mr. Kier's shop, "Uncle Billy Smith" and his two sons arrived in Titusville.

Aggravating delays followed. In artesian drilling in the early days it was necessary to begin on the rock to drill. This was previously done by digging a common conductor hole, and cribbing it up with timber. When the rock is within a few feet of the surface it was the cheapest and easiest method, but in some localities to do so would be practically impossible. They started to dig a hole, but it so persistently caved in and filled with water when they got a few feet below the surface, that Drake determined to give it up and try an experiment that had suggested itself to his mind. This was the driving of an iron tube through the quicksands and clay to the rock. If this is exclusively his own invention, which is probable, it is a pity he did not procure a patent on it. The royalty would have afforded him at least a competency, though the driving pipe is not so much in use now as formerly.

The operators in the oil region have had the benefit of his invention without any return, unless, indeed, we except the good feeling which prompted them to send him a present of $4,200 when they heard he was sick and in need.

The pipe was successfully driven to the rock—thirty-six feet—and about the middle of August the drill was started. The drillers averaged about three feet a day, making slight indications all the way down.

Saturday afternoon, August 27th, 1859, as Mr. Smith and his boys were about to quit for the day, the drill struck the top of the first sand, making the total depth of the whole well 69½ feet. They withdrew the tools, and all went home till Monday morning. On Sunday afternoon, however, "Uncle Billy" went down to the well to reconnoiter, and, peering in, could see a fluid within eight or ten feet of the surface. He plugged one end of a bit of a tin rain-water spout, and let it down with a string. He drew it up *filled with Petroleum.*

That night the news reached the village, and Drake, when he came down the next morning bright and early, found the old man and his boys proudly guarding the spot, with several barrels of Petroleum standing about.

The pump was at once adjusted, and the well commenced producing at the rate of about twenty barrels a day. The news spread like lightning. The village was wild with excitement; the country people round about came pouring down to see the wonderful well.

Mr. Watson jumped on a horse and hurried straightway to secure a lease of the spring on the Hamilton McClintock farm, near the mouth of the creek. Mr. Bissell, who had made arrangements to be informed of the result by telegraph, bought up all the Pennsylvania Rock Oil stock it was possible to get hold of, even securing much of that owned in New Haven, and four days afterward was at the well. His views of the matter had ever been the broadest, as his transactions had been the boldest.

While others were seeking for surface indications before leasing, he rushed forward, and secured farm after farm down the creek and along the Allegheny, where there were no surface indications whatever. The result has proven the wisdom of his conclusions. Drake unfortunately took a narrower view of the matter. He pumped his well in the complacent conviction that he had tapped the mine! He was probably led

into this supposition by what seemed to him the remarkable incident of having struck a crevice in the sand. No money was paid on most of the leases at first taken; a royalty of an eighth or a quarter only being reserved by the easy old farmers who owned the land, and without a cent he might have secured any quantity of territory. He was repeatedly advised to do so by shrewd men who were themselves laying the foundation of fabulous fortunes; but it was his fatal misfortune to disregard that advice. When several other wells had been struck and his eyes were opened to his mistake, it was too late—the golden opportunity had fled.

The well fell off slowly till toward the end of the year, it produced only about fifteen barrels per day. It was never pumped at all on Sundays, and averaging the production twenty barrels per day—an average probably much too high—and granting a hundred and five working days, shows the production for the year 1859 to have been twenty-one hundred barrels. But there were many days in succession when it was not pumped. At one time Mr. Smith approached one of the tanks with a light, when the gas caught fire, and the derrick, pump-house, oil vats and all were completely consumed, and it was nearly a week before operations could be resumed.

Probably two thousand barrels even would be 25 per cent. above the actual production of the four months of that year.

The second well was promptly started by Barnsdall, Meade and Rouse, and at the depth of eighty feet, in November, it was pumped for two or three days, but yielded in all less than five barrels of oil, till it was sunk to about one hundred and sixty feet, when in February, 1860, it was again started, and produced from forty to fifty barrels per day. The third well was sunk by Mr. Angier for Brewer, Watson & Co., in the spring of 1860, on the McClintock farm, and the oil was struck about the middle of December following, but both of these last wells had been put down without the aid of an engine—"stamped down with a spring pole," they called it—and after pumping by hand one day at the third well, producing twelve barrels of oil, so much water came up that operations were suspended till an engine could be got down from Erie and set up, which was not till the middle of January. Considering everything, the difficulty of disposing of the oil was much less than might have been expected. Kier contracted to take part of it at fifty-six cents per gallon, and the rest was disposed of through Scheiffln Brothers, of New York. And here ends the history of Petroleum developments on Oil Creek prior to the year 1860.

THE BISSELL-DRAKE WELL—SENECA OIL COMPANY.

THE FIRST WELL DRILLED EXCLUSIVELY FOR OIL IN AMERICA.

George H. Bissell, President; Col. Edwin L. Drake, Superintendent; William Smith, Driller; Charles and Frank Smith, sons of William Smith.

Tool-dressers and blacksmiths commenced drilling May 20, 1859; struck oil Saturday, August 27, 1859; depth of well, 69½ feet; well produced, 20 barrels of oil when first struck; well completed Saturday, August 27, 1859.

The Bissell-Drake well was the first well drilled exclusively for oil; the fact is clear and indisputable that George H. Bissell and Colonel Edwin L. Drake were the pioneers and founders of the oil business in America, and to the sagacity, ingenuity, perseverance and skill of those men the whole world is largely indebted for the knowledge and introduction of one of the most important discoveries, conveniences and social blessings of modern times.

GEORGE H. BISSELL,

OF NEW YORK CITY.

Among the earliest of the early pioneers of the Western Pennsylvania oil region, George H. Bissell, of New York City, must take a leading and prominent place. We show clearly in succeeding sketches and by historical data, that Petroleum was gathered upon the Watson Flats, near Titusville, and at McClintock ville, just above Oil City, as early as 1840, and so on down to 1856-7-8 and '59. It however, remained to Mr. Bissell to give force and effect and final triumph in developing this world-renowned benefaction.

The facts, as we give them below, are obtained from reliable data, and are given without fear of contradiction. But first of Mr. Bissell's early history:

George H. Bissell was born at Hanover, New Hampshire, November 8, 1821. He is descended from a family of Norman-French origin, which came from Somersetshire, England. His mother came of Belgic and Holland descent. One of his ancestors was the first settler at Windsor, Connecticut, in 1628. The late Governor Clark Bissell, of Connecticut, and Governor William H. Bissell, of Illinois, were relatives.

About the age of twelve years his father died, and George was thrown upon his own resources for support. He gained education and fortune, but never by the aid of a dollar from anyone. While at school and college he supported himself by teaching and writing for magazines and papers. In the business struggle, it was his own energy and talents which won the victory.

Some two years were spent at the Military School at Norwich, Vermont; another period at Kimball Union Academy, at Meriden, New Hampshire, and he was graduated at Dartmouth College in 1845. For about two months he held the professorship of the Greek and Latin languages at the University at Norwich, but resigned on account of the inadequate salary.

Going to Washington, D. C., he was employed during the winter of 1845-6 as correspondent of the Richmond Whig. In the spring of 1846 he went to Cuba, and thence to New Orleans, where he became connected with the editorial department of the New Orleans Delta. For several years thereafter he contributed largely to the columns of the different papers of that city.

In 1846, on the organization of the High School, Mr. Bissell was elected its first principal, over many

competitors. Subsequently he was chosen Superintendent of the Public Schools in New Orleans. His remarkable administrative ability and high qualifications as a scholar were of great service in his onerous position. The schools reached a discipline and prosperity before unknown. Amid the pressure of official and editorial duties, he still found opportunity to study law and several of the modern languages. In the summer of 1853 impaired health compelled him to come to the North.

It was during this year that Mr. Bissell's attention was first called to Petroleum. He saw, at the office of Professor Crosby, of Dartmouth College, a bottle of Petroleum, given Professor Crosby by Dr. Brewer, of Titusville, Pa., found upon his (Dr. Brewer's) land on Oil Creek. He became greatly interested in the product, and, about six months after, sent to Titusville Mr. J. G. Eveleth, who was then and had been previously, his partner in other business. They bought together what were then thought to be the principal oil lands of Pennsylvania. The lands were in extent one hundred acres in fee simple and one hundred and twelve acres on lease for ninety-nine years, on Oil Creek, about two and a half miles below Titusville, for which they paid five thousand dollars. In 1854 they organized "The Pennsylvania Rock Oil Company," which was the first Petroleum company in the United States.

This Company was organized under the laws of New York, with a nominal capital of $500,000, most of the stock being owned and retained by Messrs. Eveleth and Bissell, who were its officers.

The Company proceeded to develop the lands by trenching them and raising the surface oil and water into vats. The supply was very limited, amounting to perhaps a few barrels in the course of a season, which was sold at one dollar and fifty cents per gallon, to parties who retailed it for medicinal purposes. In the spring of 1855, Professor Silliman, of Yale College, was employed to analyze the oil, and Messrs. Evelth and Bissell furnished him with all useful apparatus for his experiments, and paid the entire cost of the analysis. Professor Sillimans' report, published in the fall of 1855, attracted attention in New Haven, and led to the reorganization of the Pennsylvania Rock Oil Company, with that gentleman as President.

The work of trenching the lands was continued until 1858, when the question of boring an artesian well was discussed and advocated strongly by Mr. Bissell, it having been suggested by the fact that Mr. Kier, of Pittsburg, had obtained a small quantity of oil from one of his salt wells near Pittsburg, at a depth of about 400 feet.

The New York and New Haven stockholders were not harmonious, and finally, after much discussion and difficulty, a contract was concluded between the Pennsylvania Rock Oil Company and some of its members by which the latter agreed to lease the lands for a term of years, and pay the parent Company a royalty of 12 cents a gallon on all oil raised. They then organized in New Haven a new company, based on the lease aforesaid, and employed one of their number, Mr. E. L. Drake, as Superintendent, and furnished him with the necessary capital. He proceeded to Titusville, and, after many delays and obstacles, on the 27th day of August, 1859, the first oil was struck, and the first Petroleum obtained from an artesian well drilled on Oil Creek, Venango county, Pa., and this was accomplished under the auspices of "The Seneca Oil Company," lessees of "The Pennsylvania Rock Oil Company," the organization of which, and the first purchase and development of oil lands under it, were mainly due to George H. Bissell.

Soon after the completion of the "Drake well," Mr. Bissell and Mr. Evelth began the purchase of large tracts of oil lands along "The Creek," investing between two and three hundred thousand dollars in the enterprise. Thenceforward they engaged in the production of the oil by drilling wells at various points on "The Creek," at Franklin, Petroleum Centre, &c., doubling and quadrupling their investments in munificent pecuniary returns. We have not the details of all the operations of these pioneer operators, and it is, perhaps, needless that we give them. It is enough to know that George H. Bissell's name is identified prominently, and we may add, honorably so, with all the early struggles and later triumphs in connection with this great national blessing, and that his name and fame is "a household word" among oil men from end to end of the continent.

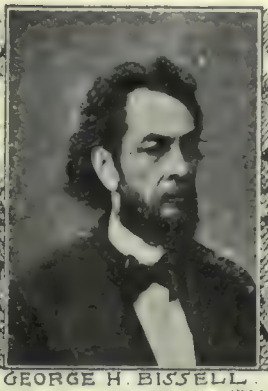
From 1859 to 1863, Mr. Bissell was a resident of the oil region, his home being at Franklin, Venango county. He erected a large barrel factory at Franklin, and continued this industry for some years. In 1866 he established a banking house at Petroleum Center, which withstood the vicissitudes and disasters of the oil region from year to year, and was regarded as one of the soundest and most substantial banking institutions in the oil country.

In 1863 Mr. Bissell removed to the City of New York. In 1864 he represented the oil dealers of Pennsylvania and the Petroleum Board of New York at Washington. He made a powerful and effectual argument before the Committee on Ways and Means in opposition to the tax on the crude material, which would have proved ruinous.

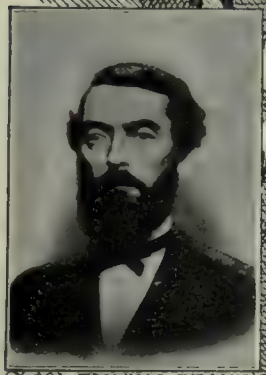
In addition to conducting an immense Petroleum business, he was at one time carrying on three banking institutions, building a railroad in the oil country, and was president and director of various companies in New York. He was prominent in the organization of the New York Loan and Indemnity Company. He was also President of the Peruvian Petroleum Company and of the Peruvian Refining Company. These companies supplied most of the Petroleum used on the Pacific coast of South America, and made large shipments to Australia, England and other countries.

Mr. Bissell was admitted to the bar of New York in 1855—to practice in the United States Courts in 1857, and to the bar of Pennsylvania in 1861. He was married in 1855 to Miss Ophie Louise Griffen, of New York City, who died suddenly in the spring of 1867. He was a liberal donor to various institutions. Dartmouth College is indebted to him for a gymnasium which cost twenty-four thousand dollars.

Mr. Bissell was an erect, well-proportioned figure and had an active step and an intellectual head and face. His head was long, towering to a round, high

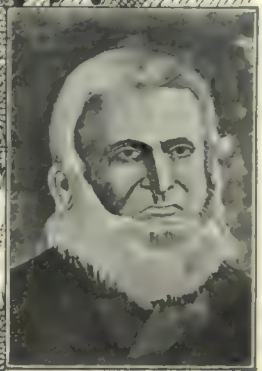


GEORGE H. BISSELL.
FOUNDER OF AMERICAN OIL INDUSTRY



COL EDWIN L. DRAKE
SUPERINTENDENT OF
BISSELL-DRAKE WELL





WILLIAM A. SMITH
DRILLER OF THE
BISSELL-DRAKE WELL

PETER WILSON — COL. DRAKE — WM. SMITH AND SONS.

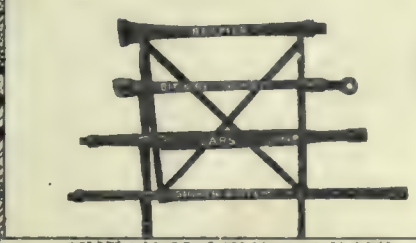


CROSS DENOTES LOCATION OF BISSELL-DRAKE WELL



ALL THAT IS LEFT OF THE BISSELL-DRAKE WELL

W.T.T



THE TOOLS THAT DRILLED
THE BISSELL-DRAKE WELL

JARVIS ENG. CO.

brow, while the other features were not less significant of mental force and the purest character.

In Trow's Directory of New York City, 1856, is found the firm of Eveleth, Bissell & Reed, oil, 346 Broadway, N. Y.

Trow's Directory of New York, 1860, George H. Bissell, lawyer, 14 Wall street; house 112 East Fourteenth street, New York.

Jonitan G. Eveleth, 1860, oil, 346 Broadway; house 4 West Twenty-second street, New York.

George H. Eveleth, 1870, President, 55 Beekman street; house 416 Fifth avenue, New York.

George H. Bissell, 1880; house 16 West Fortieth street, New York.

George H. Bissell, 1883, President, 5 Beekman street; house 16 West Fortieth street, New York.

George H. Bissell died at his home, 16 West Fortieth street, New York, November 19, 1884. Two children survive him, one son and one daughter. Mrs. Louise Pratt, the daughter, resides in the Bissell home, 16 West Fortieth street, New York, and the son, Rev. Pelham, St. George Bissell, resides on Long Island, New York.

COLONEL EDWIN L. DRAKE,

BETHLEHEM, PA.

The subject of this memoir, whose useful life will leave the mark of its individuality upon the events of the Petroleum industry, was born on the 29th of March, 1819, at Greenville, Green county, New York. His parents were poor, but respectable and intelligent people, and earned their living by farming. Edwin L. was the eldest of two sons—their only children. The brother died in the far West about the time Mr. Drake's name was heralded to the world in connection with the first oil well. When the oldest of their sons was about eight years of age, the parents removed to the vicinity of Castleton, Vermont, where they gave their children the benefit of the old-time New England common school education.

Passing an uneventful childhood, there was, perhaps, but a single incident so indicative of his future useful career as to leave any impression on his own mind, or to be worthy of remark in a sketch of his life—and that incident was a dream. It is, of course, only singular in so far that with the superstitious, it is capable of prophetic interpretation; but one can hardly be said to have had any childhood who has not had strange dreams. It was a day-dream—not a waking dream, however. He sat upon the wide old porch that shaded the entrance to their plain abode. The autumn sun shone down upon his head; and the autumn breezes, heavy with the fragrance of the fields, lulled him to sleep, and sleeping he dreamt. With his brother—in fancy—he raked the dry stubbles of the wheat field. Together they tugged and toiled, and after infinite labor they had raked a great stack of straw into a corner, nearly half a mile from the house. Then for a bon-fire! While his smaller brother watched with gleeful anticipation, Edwin touched a match to the pile. They watched it a moment in ecstacies—but their mirth was turned to horror when, their stack consumed, the ground continued to blaze and burn! They exerted all their strength to quench it, but in vain. The devouring flames rose higher and higher. The fire burned deeper and wider. It followed their receding footsteps; and now, completely terrified, they turned and fled to their mother. When they reached the house, Edwin, breathless and guilty, buried his face in her lap and confessed the deed. She led him gently to the door, and after watching the flames a moment, she said calmly, and without reproach: "My son, you have set the world on fire!"

Nearly thirty years later these words of his mother were recalled by the burning of his oil tanks a few weeks after the first well began to produce. When the tanks burst, and the creeping flames spread over the surface of the creek, he may possibly have entertained a momentary suspicion that his mother's words were about to be fulfilled. The incident recalled the dream.

At the age of nineteen he left home to seek his fortune—which meant to go West. Like the majority of emigrants in that latitude, his ultimate destination was Michigan, where he had an uncle living. At Buffalo, however, he obtained a situation as night clerk on the steamer Wisconsin, plying between that port and Detroit, where he remained until the season closed, when he went to his uncle's, near Ann Arbor, and worked on a farm for about a year.

He then procured a situation as a clerk in a hotel at Tecumseh. This was a type of the Western hotel of the day, and around the hospitable log fire upon the broad hearth it is not unlikely that Drake caught that droll and happy faculty of story-telling which was always among the genial characteristics of his manner. In this situation he remained two years, acquiring something of that Western "push" which was not developed until brought out by the difficulties which beset his labors years later on Oil Creek.

After leaving Tecumseh he returned to visit his parents in Vermont, and was persuaded to remain in the East.

He next went to New Haven, Connecticut, where he served three years as clerk in a dry goods store. They were three uneventful years, and in the hope of bettering his prospects he gave up his situation and obtained a position in one of the retail dry goods stores on Broadway, New York. While here he married a young woman whose home was in Springfield, Mass., and soon afterwards, falling into a lingering illness, it became advisable to seek country air, and they went to Springfield. While there Mr. Drake was offered the position of Express Agent on the Boston & Albany Railroad, at a salary of fifty dollars a month, which he accepted, and held the position till 1849, when he resigned it to accept the office of Conductor on the New York & New Haven Railroad, then just opened, which he held nearly ten years, with entire satisfaction to the superior officers of that corporation, and only resigned it to take charge of the developments on Oil Creek in Pennsylvania, as described in the opening chapters of this work.

The position he held on the railroad gave him the opportunity of forming an extensive acquaintance, which his inclination prompted him to improve. In

1854 his wife died, leaving him one child, two others having already died; and he broke up the comfortable little home he had provided in New Haven, and went to boarding.

It was about this time that he made the acquaintance of James M. Townsend, a banker in New Haven, into whose society he was thrown at the Tontine Hotel, where, at the time, both made their home. A few years afterward, when the prospects of the Pennsylvania Rock Oil Company were under a shadow, Mr. Townsend, who, amidst the allurements of social intercourse, kept an eye upon business, induced his friend Drake to invest a little balance of two hundred dollars which he had in bank, in stock of that corporation, and sold him a part of five hundred shares which he himself held. This was the beginning of his connection with the business which has rendered his name famous. About the first of the year 1857 he married Laura Dow, of New Haven, a young woman of most excellent character, who had ever been to him a friend and guide in prosperity, and a staff and a light in the gloomy days of adversity and want. During the summer of 1857 Mr. Drake was compelled by debilitating illness to give up work on the railroad for a couple of months; but at the same time he was not prostrated, *and*, having at least an "inquiring" interest in the Pennsylvania Rock Oil Company, he began to investigate its prospects, and the subject of Petroleum generally. He had leisure time for conversation with the directors, of whom his friend Townsend was one, and also President of the board.

The new idea of developing the property by artesian wells had been suggested some time before, and found in Mr. Asahel Pierpont, an intelligent and persistent advocate. Business complications forbade the thought of his going to attend a matter so far away from home, and perhaps the growing dissensions of the company discouraged the hope of efficient action in a legitimate way. The Board of Directors consisted of five members, three of whom were residents of New Haven, as required by the by-laws adopted, and, though representing but a third of the whole stock of the company, they controlled the management of its affairs. From what followed—all of which has been minutely described in this book—it is indisputably clear that the New Haven stockholders were determined to secure to themselves the advantages of this new idea.

In December of the year 1857, Mr. Townsend, then President of the Board of Directors, engaged Mr. Drake to proceed to Venango county, as has been previously stated. He finished his business, and returned, enthusiastic to embark in the enterprise which they had projected.

On the last of the month, the New Haven members of the board—a majority and a quorum—met and executed a lease of the lands to Mr. Bowditch—one of the largest New Haven stockholders—and Mr. Drake, the terms of which were remarkably advantageous to the lessees, but which it was found necessary to change before the other members would permit them to go on.

When all was satisfactorily arranged with the old company a new corporation was formed called "The Seneca Oil Company," of which Mr. Drake was the nominal President, and in which he appeared as the principal stockholder.

In the published article of association the stock was subscribed as follows:

	Shares.
W. A. Ivis	2,680
E. L. Drake	8,926
J. F. Marshall	394

But of the 8,926 shares which were in his name, Drake, according to a previous understanding, transferred all but 656 to the other members of "The Pennsylvania Rock Oil Company," and it then stood as follows:

Asahel Pierpont	3,334
James M. Townsend	2,785
William A. Ivis	2,680
Edwin E. Bowditch	1,630
E. L. Drake	656
Henry L. Pierpont	521
J. F. Marshall	394
Total	12,000

This comprised all the New Haven members of The Pennsylvania Rock Oil Company, of which the largest stockholders in the new company—Pierpont, Townsend and Ivis—were directors.

In the following spring Mr. Drake set out for Titusville with his little family, and until a house was prepared boarded at the American Hotel. Himself, wife and two children and a horse were boarded for six dollars and a half per week, where a few years later they would only have been entertained for about twice that amount per day.

Shortly after arriving he bought a tract of twenty-five acres of land in Titusville, of Jonathan Watson, through the center of which Drake street now runs.

He unfortunately sold this in 1863, realizing about ten thousand dollars by the bargain. It was shortly afterwards sold for ninety thousand dollars.

Nothing perhaps better indicates the condition of the little village than the fact that a few weeks after his arrival, being in want of a couple of picks and spades, he found there were none to be had short of Meadville, or Erie. Though his life at the well was crowded with incidents, they were incidents now too common to be any longer interesting.

After oil was struck there was some difficulty in obtaining a market for it—a difficulty which, indeed, continued to increase, until in a couple of years' time, it was for a season nearly impossible to sell at any price. There was no room for delay, and relying upon his integrity to shield him from the imputation of improper motives, naturally counting something on his service to the company and his own interest in that company's welfare, he hastened at once to Pittsburg and contracted to furnish about a third of the oil to S. M. Kier, and arranged hastily with Mr. George M. Mowbray for the disposal of the rest on commission.

In 1860, Mr. Bissell proposed a division of the lands in lieu of the twelve cents per gallon royalty, and the Seneca Company thus obtained in fee simply one-third

of the land which Drake afterwards sold for them, for enough to clear them of all indebtedness, though it is doubtful if they made a dime by the whole transaction. Indeed, they declared they did not.

In 1860, Drake was elected Justice of the Peace for Titusville, an office worth about three thousand a year at that time, when every man was rushing to sell or buy leases, the documents for which he mostly drew and acknowledged. At the same time he bought oil for Shiefflin Bros., of New York, and thus increased his income to about five thousand a year.

In 1863, he sold his property, and left the oil region forever, taking with him between fifteen and twenty thousand dollars, and united himself with some Wall Street broker, in oil stocks. It was a very unfortunate, not to say short-sighted move, for a man with his total ignorance of the manipulations of stocks, and with so limited a capital.

His little fortune was soon engulfed. His health, already impaired by his labors on the Creek, gave way and his noble wife now cast about to secure the future. She removed the family to a cheap and quiet abode in Vermont, and hoarded to the last the little she had been able to save from the wreck.

But his illness lingered and his strength failed, and his physician advised him, if possible, to seek the sea air. A friend kindly offered the use of a cottage on the Highlands-of-Never-Sink, near Long Branch, New Jersey, and thither they removed. But their funds were now exhausted, and their misery began indeed.

His disease was most agonizing; neuralgic affection of the spine, which constantly threatened paralysis of the lower limbs. He needed constant care, and his wife, surrounded by a family of four helpless children, attempted to keep them in bread by her needle. Sewing she could obtain in plenty, when she could tear herself from other absolute duties, to go after it, tramping through wet meadows and chill and choking sea fogs that roll in on that dreary point. But with all her noble and uncomplaining effort to keep them in bread without begging, she found it impossible. Medicines were out of the question, and with the greatest difficulty she got together the price of his fare to New York and back—eighty cents—and he struggled up to the city to get a situation for his eldest son among some of his old acquaintances. Before returning in the afternoon he was met and recognized in the street by Mr. Z. Martin, of Titusville, who noticed his wretched appearance, and drew from him the story of their misery.

Mr. Martin, after providing him with a warm dinner, of which he stood sorely in need (for above the money to pay his fare he had not enough to pay for a cup of coffee, and he was weak from hunger), gave him twenty dollars, and cheered him with the hope of raising a fund for him in the oil region. No sooner was his distress made known than with a generosity for which they have ever been famed, the citizens of Titusville, with some aid from individuals throughout the region, raised four thousand two hundred dollars for his relief, which wisely enough was committed to the management of Mrs. Drake, who frugally hoarded it, and yet continued to meet a part of the family expenses with the wages of her needle.

In 1870, on the advice of his physician, she removed her invalid husband and three smallest children to Bethlehem, near Allentown, Pennsylvania, where they lived a number of years, beloved and respected by a large circle of friends who had gathered about them.

In conclusion we have the pleasure to record the fact that the Legislature of Pennsylvania, at its session in 1873, deemed it proper to pass a law which granted to Colonel Drake a pension of fifteen hundred dollars a year during life, or that of his wife. This was not charity, but simple justice.

Colonel Edwin L. Drake died at Bethlehem, Pa., November 8, 1881, and his body now lies at rest in Woodlawn Cemetery, at Titusville, Pa., where a fine crescent-shaped granite monument was erected in his memory. In the center of the monument is a figure in bronze of an ancient stone driller. On the arch above the figure is the name Drake and on each side of the figure are three panels, and on these panls is inscribed the following:

No. 1.

Col. E. L. Drake: Born at Greenville, N. Y., March 29, MDCCCXIX; died at Bethlehem, Pa., November 8, MDCCCLXXX. Founder of the Petroleum industry. The friend of man.

No. 2.

Called by circumstances to the solution of a great mining problem. He triumphantly vindicated American skill and near the spot laid the foundation of an industry.

No. 3.

That has enriched the state, benefited mankind, stimulated mechanic arts, enlarged the pharmacopoenia and has attained world-wide proportions.

No. 4.

He sought for himself not wealth, not social distinction; content to let others follow where he led. At the threshold of his fame he retired, to end his days in quieter pursuits.

No. 5.

His highest ambition was the successful accomplishment of his task. His notable victory the conquest of the rock. Bequeathing to posterity the fruits of his labor and of his industry.

No. 6.

His last days, oppressed by ills, to want no stranger. He died in comparative obscurity. This monument is erected by—(Name to be added here after the death of the giver)—in grateful recognition and remembrance, at Woodlawn Cemetery, Titusville, Pa. Dedicated October 4, 1901, and finished September 4, 1902.

DEVELOPMENTS ALONG OIL CREEK.

After oil was struck on the island in Oil Creek, at the junction of Pine, the development spread rapidly thence to its mouth, where now is situated the thriving



DRAKE MONUMENT.
WOODLAWN CEMETERY.
DEDICATED OCTOBER 4TH 1901. FINISHED SEPTEMBER 4TH 1902.
TITUSVILLE, PA.

city of Oil City, containing about fifteen thousand inhabitants, and fast growing into a solid business center.

With one stride, indeed, the whole territory was virtually thrown open to employment, for the very day that Drake's well began to pump, Brewer, Watson & Co. leased the Hamilton, McClintock Farm, below Rouseville, where the "surface indications" were even better than on their own tract, which had passed entirely from their control to The Pennsylvania Rock Oil Company. Here they immediately began to drill a well—the third one ever drilled for oil—and all the intermediate territory for sixteen miles along the narrow valley of Oil Creek was soon taken up.

At first, it is true, speculators looked for "surface indications"—"pebble rock," "oil springs," &c.—and leased only where they were found; but when a few older or better informed minds took the initiative others followed, and a few months' experience proved that there was no reliance to be placed in "surface indications," and that good wells were as likely to be obtained half a mile away, as beneath the most productive natural spring.

The second well, on the Watson flats, below Titusville, was begun within a few days after the completion of the first, by Messrs. Barnsdall, Meade, Abbott and Rouse. It was situated a little above, and almost within stone-throw of the first, and, though it was tested in November, 1859, it had to be drilled deeper and was not finally completed until February of the following year. Like the third, drilled by Mr. Angier, for Brewer, Watson & Co., on the McClintock Farm, this was also put down by means of a spring pole; and, indeed, the same is true of several hundred of the first wells drilled along the Creek; nor was the system entirely abandoned before 1865; and to strong men, whose means were limited; it afforded a ready mode of development that answered a good purpose in opening up "shallow" territory; but it was a means totally inadequate when they began to drill wells below four or five hundred feet.

THE FIRST LARGE FLOWING WELL IN AMERICA.

The first flowing well or "gusher" in America was named "The Fountain," which was drilled in May, 1861, on the David McElhenny Farm, near Petroleum Center, on Oil Creek, in Pennsylvania, by Captain A. B. Funk. The well was drilled to the third sand and flowed at the rate of three hundred barrels a day. Everybody went wild over the new industry; people flocked to the oil region as if it had been a gold field, and the hillsides along Oil Creek were thickly dotted with derricks; new fields were discovered and drilled, and the richly productive oil sands were found to cover an area extending northeastward into New York and southwestward through Pennsylvania, West Virgina, Southeastern Ohio, Kentucky and Tennessee. This is known as the White Sand Oil Belt, and produces the light yellow and amber colored oils which are the highest grade of crude oils produced in the world.

The oil is produced from the following named sands: First, Second and Third, Oil Creek, Glade, Clarendon, Warren, Cherry Grove, Kane, Elk, Bradford, Hundred-foot, Speechley, Cow Run, Dunkard, Maxon, Salt Sand, Keener, Big Injun, Berea Grit, Gantz, Fifty-foot, Stray, Gordon, Fourth and Fifth. This is the strata of the Devonian age. Later came the discovery of crude oil in the much older rock or sands, known as the "Trenton Rock."

The history of oil production has been very much the same in all the different fields, whether the region has been covered with the primeval forest, or occupied by thriving farms and villages. The derrick has been no respecter of anything; the forest has melted away before the demand for timber to make derricks, engine-houses, boiler-houses, tanks, tank-houses and steam-boxes.

After the farm has been leased a location is made, usually on low land near a stream of water; the water is needed for the boiler and to mix the drilling. After the location is made a derrick or rig is built; this is called a "wild cat well." If it comes in a duster or dry hole, nothing will be said about it, but if it comes in a good well it will cause great excitement; new locations will be made, temporary roads are then cut in every direction to the locations, the rigs are then built, and in a short time the thud of the drill is heard night and day.

Long before the Fountain Well had given out the wonder in regard to it was overshadowed by a new sensation. On the Tarr Farm, the "Phillips Well" burst forth with a stream of three thousand barrels of oil daily! Not to be outdone by the territory down the Creek, the Empire Well in the immediate vicinity of the Fountain Well, suddenly burst forth with its three thousand barrels daily, figures which subsequent flowing wells vainly endeavored to equal.

Kier & Co., of Pittsburg, began to develop the J. W. McClintock Farm, on which the village of Petroleum Center was located. Hibbard & Co. began on the John McClintock Farm; Henry R. Rouse, S. Q. Brown, John Mitchell and others, on the Buchanan Farms; Crossley & Fletcher on the Stoeppel Farm—all before the first of February, 1860. "The Crossley" was the third well completed; and upon the flats below Titusville and up the valley of Pine Creek as far as Enterprise, there were not less than twenty companies and individuals preparing to put down wells as soon as the spring opened.

The number of farms between the island on which oil was first struck and the mouth of Oil Creek, a distance of between sixteen and eighteen miles, was forty-three, and, though most of the statistics of the early operations are now hopelessly lost, from the few preserved we are able to glean the following:

The Island tract, embracing one hundred and five acres, originally owned by Brewer, Watson & Co., was transferred to George H. Bissell and Jonathan G. Eveleth, of New York, in 1854, and by them put into a joint stock company, called The Pennsylvania Rock Oil Company. In 1858 the property was leased to The Seneca Oil Company, which put down the first well.

The lease ran for forty-five years, and as the decline in the price of oil made it ruinous to pay the royalty of twelve and a half cents per gallon, The Pennsylvania Rock Oil Company came to an agreement by which The Seneca Oil Company took a small portion of the



THE GREAT NOBLE AND DELAMATER WELL
FARREL FARM, OIL CREEK, PA. 1863.

land in fee, and gave up the lease in the summer of 1860.

After this was accomplished George H. Bissell purchased the interest of The Pennsylvania Rock Oil Company, of which he was himself principal shareholder, for fifty thousand dollars, and that portion of the tract was thereafter known as the Bissell Farm.

Mr. Bissell at once began actively to develop the farm, putting down ten or twelve wells, six of which were productive, and yielded for some time eighty barrels per day, which was much better than any other territory in the immediate vicinity. The farm a few years later was sold to the Original Petroleum Company.

Next below this is the Griffin Farm, located on both sides of Oil Creek, and containing the ruins of several derricks. The property was pretty well developed after passing into the hands of the New York and Pennsylvania Petroleum Company, and below this is the Crossley Farm, on the east side of the creek, which, though well developed, was never very productive territory; and this is again followed by the second Bissell Farm, owned by George H. Bissell & Co., which, like all the rest of the territory which came under the management of this energetic man, was thoroughly and successfully developed.

Below the second Bissell Farm are the two Stackpole Farms, partly covered by one of the large dams used in the production of pond-freshets.

The upper Stackpole Farm passed into the possession of the Northern Light Oil Company and Brewer, Watson & Co.; the lower one contained ten wells and two abandoned refineries. Then follows the Pott Farm, on which there have been no producing wells, and next below is the Shreve Farm, owned by the Great Western Consolidated Oil Company, but, like the farm above, it has not been productive territory.

The Shreve Farm is followed by the J. Stackpole Farm, which came into the hands of Brewer, Watson & Co., and was well developed by sub-leases, but without remarkable success.

The Flemming Farm, next below, owned by Mrs. Flemming, was found to be, if not entirely unproductive, at least remunerative territory, and without any evidences of development.

The same may be said of the Henderson Farm, which is just below it.

The Jones Farm, which is next in order, though thoroughly tested by drilling nearly twenty wells, it never proved productive territory, yet from surface indications it was as promising as any farm along the Creek.

The second Flemming Farm, a little more than four miles below Titusville, is next after the Jones Farm, and the beginning of better territory. The flats on this farm were thoroughly tested, and several good wells obtained; one, a flowing well, was successfully operated for some time, when the owner, hoping the more completely to shut off the surface water and increase the flow of oil, drew up the tubing to change the locality of the seed-bag; but after rearranging it, from some unaccountable cause, the well not only ceased to flow, but never again produced oil.

The Miller Farm, then a station on the Oil Creek Railroad, and formerly the scene of great enterprise on the part of the Pit Hole and Miller Farm Transportation Company, is the first below the second Flemming Farm on the Creek.

Though formerly excellent territory, having a great number of good flowing and pumping wells, it now produces little or no oil, and owing to the improvements in the manner of transporting oil by pipe line, and the fact that many of the refineries once operated there are now abandoned, the enterprise that once marked the place has almost entirely subsided.

From the Miller Farm to the mouth of the Creek at Oil City, the territory has been incomparably the best ever discovered, producing up to 1868 probably two-thirds of all the oil brought to the surface to that date.

The Shaffer Farm, which is next, though containing but little more than fifty acres, was formerly one of the moderate producing farms on the Creek. This farm, though, in the year 1864, containing less than a half dozen buildings, was for a time the terminus of the Oil Creek Railroad, and immediately became a shipping station of great importance, for the oil was then shipped in barrels, and not less than fifteen hundred teams were employed in hauling it to the cars from the wells, and, together with their drivers, and other auxiliaries, these supported the innumerable stables, hotels and eating-houses that sprang up in a night like mushrooms. Though at one time the village on Shaffer Farm numbered over two thousand inhabitants, there is hardly a house now remaining to mark the scene of former activity.

When the road was extended, the buildings were taken down and removed to the next station.

The Sanney Farm, which is the first after the Shaffer, though not unproductive, has not been remunerative territory; and, though once the seat of a number of small refineries, is now completely abandoned; and the same may be said of the Gregg Farm, which follows:

The Beatty Farm, just below, lying at the mouth of Hemlock Run, has done better, and once contained a number of good wells, several of which were up the run.

The Farrell Farm, though containing but thirty-six acres, has been probaly the most remunerative bit of country property of its size in the whole oil regions. Its original owner was James Farrell, but a part of his interest was sold to the Commonwealth Oil Company. It is situated on Bull Run on the east side of Oil Creek. The renowned Noble and Delamater well, which flowed three thousand barrels of oil a day when first struck, commenced in 1863, and continued to flow till 1865, and is estimated to have produced upwards of three million dollars' worth of oil; and another well, the Craft, on the same farm, produced over one hundred thousand barrels.

Besides these there were several other good wells on the tract, but all of them are now abandoned. Opposite this, on the other side of the Creek, is the Foster Farm, rendered scarcely less famous by the great Sherman well, which began flowing in 1862, at the


JAMES S. McCRAY FARM
McCRAY HILL
PETROLEUM CENTER OIL CREEK, PA.
1870 – 1874
X TRIED TO SINK SHAFT TO OIL SAND.

rate of two thousand barrels per day, and for nearly two years is said to have averaged nine hundred barrels per day. It commenced to flow in May, 1862, and ceased in February, 1864; but for a long time afterward it was successfully pumped. On the other side of the Creek again, bounded by both the Foster and Farrell Farms, lies the Caldwell farm.

The famous well of the same name, struck on this farm in the spring of 1863, being found to have a subterranean connection with the Noble and Delamater well, the owners of the latter offered to buy it, and it was sold with an acre and a half of land for the sum of $145,000.

The upper McElhenny Farm, which is next below these, was one of the first to be thoroughly developed, and was always one of the best producers. A great number of wells were drilled on this farm in the years 1860, 1861 and 1862, and, though none of them were large enough to be remarkable, nearly all were remunerative.

The Espy Farm adjoining was remarkable for the old Buckeye well, and proved valuable territory. The flats on this farm were developed among the earliest, but the uplands tested several years later were very productive.

The Benninghoff Farm, which lies between the two McElhenny Farms on the Creek, at the mouth of Pioneer Run, was at one time remarkable for the great number of its flowing wells.

Most of the wells on this tract flowed when first struck, and though none of them were large, all were lasting, and the territory very sure.

A number of joint stock companies were chartered to work leases on this farm, for it was brought into market at the period of the great excitement.

John Benninghoff was robbed at his home on Benninghoff Hill, Oil Creek, Venango county, Pa., Thursday evening, January 16, 1868, by James Saeger, George Miller, John McDonald, George Eliott, Jacob Shuppert, Henry Geiger and Lewis Warlde. Mr. Benninghoff did not believe in depositing his money in banks. He bought an old iron key-lock safe and kept his money and valuable papers in it. The night of the robbery the safe contained $280,000 in money and $100,000 in government bonds. Two hundred and sixty-five thousand dollars was stolen; $10,000 in bills and $5,000 in gold was overlooked by the robbers. The robbers held Mr. Benninghoff and family at bay with guns and revolvers. The money was divided up between the robbers at Lewis Warlde's hotel at Meadvile, Pa. James Saeger, the organizer of the gang, took $100,000 of the money as his share and went to Colorado and bought a ranch and stocked it with cattle. James Saeger is living in Colorado at the present time.

Jacob Shuppert, Lewis Warlde and George Miller served one year in the Western Pennsylvania Penitentiary for the robbery. The others were never captured.

The lower McElhenny Farm, situated on both sides of Oil Creek, below the Benninghoff Farm, was one of the earliest developed, and for many years continued to be one of the most productive.

It was purchased, like the upper McElhenny Farm, of the original owner, by Hasson and McBride, and L. Haldeman & Co.

The most remarkable wells on this farm were the Empire and Crocker, the former of which started off at two thousand five hundred barrels a day, and after yielding an average of two thousand barrels a day for nearly four months, finally dropped off to three hundred, and then ceased altogether. Among the other best wells on the farm were the Burtis and the Davis.

The Boyd Farm, next below this, singularly enough proved very poor territory, though it was surrounded by that which was exceptionally good. It was at one time the seat of several small refineries, all of which have been abandoned.

The Stevenson Farm, in this vicinity, but not reaching to the Creek, was developed in 1865, and proved to be valuable territory, though possessing no valuable features.

On the James S. McCray Farm, at Petroleum Center, the first wells were drilled on the flats along Oil Creek, which nearly surrounded half of the farm, and some of the largest wells that were struck on Oil Creek in 1863, 1864 and 1865 were drilled at the base of that hill on which the farm is situated. In 1865, when the production on the flats was at its height, Mr. McCray refused half a million dollars in cash for the farm. Early in the spring of 1870 Keffer and Watson, operating on the Dalzell tract, on top of the hill, struck a well which began to flow four hundred barrels of oil a day. This well was near the McCray line, and when it was struck immediately leases were in anxious demand on the McCray farm on top of the hill, and operators were crowding to obtain them on any terms at all. He, however, fixed a uniform price of one thousand dollars per acre bonus and one-half the oil. Even at these unusual figures there were plenty of experienced operators ready to take leases. He also began to operate himself on a large scale, and so remunerative was the territory that in the whole oil region of Pennsylvania there is not today another piece of land equal in size on which so many paying wells were drilled. Six months after oil was struck on the hill and eight years after the first well was drilled on the same flats, this farm produced over twenty-seven hundred barrels of oil a day, yielding to its owner, James S. McCray, the enormous income of more than six thousand dollars a day, and yet but little more than half the production was his. The farm produced eight hundred and fifty-one thousand barrels of oil.

The J. W. McClintock Farm, on which the once flourishing city of Petroleum Center was situated. The farm contains two hundred and seven acres, and was leased in November, 1863, by George H. Bissell & Co., and in the following February put into a joint stock company called the Central Petroleum Company of New York.

It embraces, besides the land on which the town is situated, the circular ravine to the left, called Wild-Cat Hollow, nearly every square rod of which was perforated with a well. Not less than a hundred and



THE PHILLIPS AND WOODFORD WELLS

TARR FARM, OIL CREEK, VENANGO COUNTY, PA., DECEMBER, 1861

fifty wells were drilled on this territory, and nearly eighty per cent. of the whole number were remunerative; and this was undoubtedly—until the opening up of the Parker's Landing field, which was for the most part very sure territory—the best showing made by any farm in the region.

The remarkable results shown by this farm were undoubtedly due quite as much to the excellency of its management as to the superiority of the territory, and stands a bright example of the result of the judicious and economical management of an oil farm. Instead of giving out leases at random, to parties willing to pay a large bonus for the sake of getting leases on which to found speculative joint stock companies, and then in all probability—having enriched themselves by the sale of stock, neglect the development of the land—instead of pursuing this course, so common in the oil region, they only gave leases to actual operators, and at a uniform royalty of one-half the oil.

In 1865 a bonus of one hundred thousand dollars and "one-half the oil" was offered for ten leases on the farm, but promptly refused, and the result proved the wisdom of the decision, for, while the owners may not have realized more than this, they retained the unrestricted control of the property.

Three million dollars' worth of oil, or more, must have been taken from this territory, and the revenue from ground rent, for building, at one time was very great. The village retains of its former population only about ten persons, and, as the farm is now exhausted beyond the hope of another excitement, must continue to decay.

Scarcely less decided was the success that attended the development of the Hyde and Egbert Farm, on the other side of the Creek along the foot of the McCray hill. It was purchased in 1859, of the original owner, Davidson, and soon after tested with fair results, but it was not until 1863 that the flowing wells, which rendered this terrritory the subject of such wild speculation, were struck.

The Maple Shade and the renowned and singular Coquette well are the most remarkable in the history of this farm.

The first operations here were the least successful, and thus it came to be looked upon as doubtful territory for some time.

The Hayes Farm, below the Hyde and Egbert, is situated on both sides of the Creek, and, though pretty well developed, it was never so well managed as many of the farms by which it is surrounded.

On this farm was attempted the experiment of digding a shaft five feet by seventeen, to the oil-bearing rock known as the "third sand." The enterprise was undertaken by the Petroleum Shaft and Mining Company, and the shaft was commenced in the rear of the Maple Shade, near the line of the Hyde and Egbert Farm. Though unfortunately for the cause of science, the gas would have renderd the enterprise impracticable, it was abandoned for want of means, when down less than a third of the distance.

The H. Story Farm, better known as the Columbia Farm lies directly below the Hayes. It was bought in 1859 by Pittsburg parties, for eleven thousand dollars, and some other contingent benefit, and shortly afterward put into the Columbia Oil Company. The Columbia Oil Company was chartered by Act of the Legislature of Pennsylvania, May 1, 1861. D. B. Stewart, President; G. S. Bancroft, General Superintendent; D. H. Boulton, Assistant Superintendent. Directors: Thomas Scott, J. Edgar Thompson, Andrew Carnegie, D. B. Stewart, William Melville, David McCargo, Robert Pitcairn.

The Columbia Oil Company in 1862 purchased the H. Story Farm from a syndicate, which bought the farm from H. Story and wife in 1860, paying them eleven thousand dollars for the farm, and sold it to the Columbia Oil Company in 1862 for $128,000.

The Columbia Oil Company was organized with a capital of $200,000, divided into 10,000 shares of a par value of twenty dollars each. During the year 1862 the stock varied in price from two dollars to ten dollars per share. At that time the chief difficulty with the company was the receipt of twelve hundred barrels of oil a day, and no market for it, but a foreign demand soon sprung up. About that time Col. Thomas Scott and other high officals of the Pennsylvania Railroad Company got control of the Columbia Oil Company and began shipping the oil to Philadelphia and other seaboard cities at less than the cost of any other shipper, and the company at once began to make money. Between 1862 and 1864 the company paid as dividends $300,000. In April, 1864, $70,000 as dividends was paid the stockholders, in May $100,000, and in June $100,000. The dividends between July and December, 1864, were $625,000, making a total of dividends since the formation of the company, $1,195,000. In June, 1864, the old shares were called in and new ones issued of fifty dollars each. The holder of an original twenty-dollar share received five new ones of fifty dollars each. The person who paid one year and a half before, in 1862, the par value of twenty dollars each for one hundred shares and held his stock to June, 1864, received $12,000 in dividends to December, and from the profits on the increase of capital made in June, 1864, obtained an accession to his stock of four hundred shares, which were worth with the original one hundred at the then market price $42,000, making a clear profit of $52,000 in eighteen months. If he bought the original shares at their lowest price of two dollars each, that profit was made on a capital of two hundred dollars for one hundred shares at two dollars per share.

Next below, and on the opposite side of the Creek, is the Tarr Farm, one of the very best on the Creek, and renowned for the Phillips and the Woodford wells, the first of which, when struck, is said to have produced 3,000 barrels per day, and the latter 1,000 barrels per day, though in both cases it is probable the figures are too high.

They were situated within two rods of each other, and the subterranean connection between their sources of supply was so manifest that when the "Woodford" pumped the only remedy left the "Phillips" was to

draw the tubing, and let the surface water down to shut off the oil from both.

Enormous sums were offered by both owners, but as either had it completely in his power to render the property of the other worthless, neither was willing to settle until both wells were nearly ruined by the surface water, and the consequence was that many smaller wells than either yielded as much oil as both. These famous wells were located on the bank of the creek to the left (going down of the railroad bridge.

The Blood Farm was one of the earliest to be developed, and therein may be said to have been its misfortunes, for in 1861 and 1862, when oil was almost valueless, often selling in bulk as low as ten cents per barrel, and not infrequently suffered to run to waste as utterly worthless, this farm produced more than all of the oil region together, and before the time of speculation and high prices was exhausted, or nearly so, there were a great number of good wells, many of them flowing, and one that flowed 2,500 barrels per day. Below this, at the mouth of Cherry Tree Run, is the Rynd Farm, which, though now producing comparatively little, was once good territory. Not less than a dozen different companies had interests in this farm, and the whole flat has been perforated with holes, though it was rather uncertain territory. The Widow McClintock or Steele Farm, next below, was also good territory. The farm was the property of the widow, Mrs. McClintock, who was herself burned to death in 1864, while lighting the fire with oil, and left the farm together with all the accumulated money of two years' production, to her adopted son, John Steele. It has since passed from his possession, and is now in the hands of John W. Waitz. Its production at present is very small.

The John McClintock farm, below this, at the mouth of Cherry Run, commenced producing in 1860, and, like those immediately above it, produced at a time when oil was worth least.

The number of wells sunk on this tract cannot now be ascertained, but must have been very great. Though but few of them were large enough to be singular, nearly all were remunerative.

There were also several refineries on the farm at one time, which are now abandoned.

The Buchanan Farms, situated on either side of Cherry Run, being mostly upland, neither of them were thoroughly developed until the speculative fever of 1864 and '65 brought them into the market as the basis of the formation of joint stock companies, but the narrow flats along Oil Creek had previously been tested with considerable success.

The village of Rouseville, still a flourishing town, with a population of nearly three thousand, is situated partly on both of these farms.

Though both farms have been quite productive, and have had several large wells, the percentage of dry holes has been very great.

There were several smaller refineries on both those farms, and the number of stock companies was beyond all belief.

The Hamilton McClintock Farm, containing three hundred and fifty acres, is situated at McClintock's Station, on the Oil Creek Railroad, and lies on both sides of the stream. It is one of the first farms that came into the market as oil territory—being, in fact, the second—for here were found the surface indications which for the first year or two were thought by most operators necessary to warrant the drilling of a well.

Some years before the idea of adopting artesian drilling in the development of Petroleum had dawned upon the world, the owner, Hamilton McClintock, had collected oil from a spring that bubbled up in the middle of the Creek, and around which he built a crib in order to prevent the oil from being borne away on the current of the water. By occasionally skimming the pool inside this crib, and sometimes agitating the ground with a pick or crowbar to the depth of a few inches, he collected several barrels in the course of a year without giving himself much trouble, and it was all disposed of with some profit to the surrounding farmers, and was sent to Pittsburg by the lumbermen in the spring of the year. But, though fifty barrels *might* have been collected, it is doubtful—reports to the contrary notwithstanding—if ever more than five actually *were*. The third well to produce oil on the Creek was drilled in this crib for Brewer, Watson & Co., by J. D. Angier. The town, which took its name from the farm, and which was once a brisk, little place, has been nearly obliterated.

The Clapp Farm, purchased of the original owner in 1859, by George H. Bissell and Arnold Plummer, was thereafter at once thoroughly developed, and, though there was a large percentage of dry holes, the number of paying wells was also very great, and the fact that Mr. Bissell was at the same time conducting the largest barrel factory in the oil region, enabled him often to ship his oil to market when others either sold it to speculators for ten cents a barrel, or let it run to waste because they could not afford to pay two and two and a half dollars apiece for barrels to ship it in.

The total daily product of all the wells in June, 1860, was estimated at two hundred barrels. By September, 1861, the daily production had reached seven hundred barrels, and then commenced the flowing well period, with an addition to the production of six or seven thousand barrels a day. The thing was monstrous, and could not be endured! The price fell to twenty cents a barrel, then to fifteen, and then to ten! Coopers would sell barrels for cash only, and refused to take their pay in oil, or in drafts on oil shipments. Soon it was impossble to obtain barrels on any terms, for all the coopers in the surrounding country could not make them as fast as the Empire well could fill them. Small producing wells were forced to cease operations, and scores became disheartened and abandoned their wells. The production during the early part of 1863 was scarcely half that of the beginning of 1862, and that of 1864 was still less. In May, 1865, the production had declined to less than four thousand barrels per day.

Names of oil companies and officials operating on the Allegheny River and Oil and French Creeks, in Pennsylvania, in 1863, 1864 and 1865:

Weikel Run and M'Elhenny Oil Company; capital, $230,000; 2,300 shares, $100 each. A. B. Stone, President; D. P. Eels, Vice President; E. J. Farmer, Treasurer; F. C. Prentiss, Secretary; G. E. Herrick, Counsel. Directors: J. D. Rockefeller, W. C. Scofield, A. B. Stone, C. C. Cobb, E. J. Farmer, J. V. Painter, D. P. Eels, H. Chisholm, R. L. Chamberlain.

Milton Farm Oil Company; capital, $200,000. Lubricating oil producers, Franklin, Pa. President, H. Garretson, Cleveland, Ohio; Vice President, Amos Townsend, Cleveland; Secretary and Treasurer, Alfred Ely, Jr.; Company Attorney, Roland D. Noble. Directors: Lemanuel Crawford, George W. Howe, George B. Hicks, J. G. Graham, N. P. Payne, John Tennis, P. I. Price.

Cleveland and Buffalo Petroleum Company; capital stock, $180,000. Officers: R. K. Winslow, President; George H. Burt, Vice President; John J. Myers, Secretary and Treasurer.

Pittsburg and Allegheny Valley Oil Company; capital, $200,000, divided into 100,000 shares of $2 each; $180,000 invested in real estate; $20,000 appropriated for working capital. This company was organized under the General Mining and Manufacturing Law of Pennsylvania. Officers: Curtis G. Hussey, President, Pittsburg, Pa.; Thomas H. Howe, Secretary and Treasurer, Pittsburg; Henry Holdship, Director, Pittsburg; James W. Clark, Director, Boston, Mass.; George Sinclair, Director, Cleveland.

Cleveland and Cherry Valley Oil Company; capital, $50,000; 50,000 shares, par value $10. Officers: B. F. Peixotto, President; Edward Budwig, Secretary; C. Koch, Treasurer.

Army Oil Company; capital, $150,000. Officers S. N. Payne, President; W. D. Mann, Vice President; D. Stratton, Secretary; T. S. Beckwith, Treasurer; L. Sternberg, Superintendent; T. J. Carran, Attorney. Leases on McClintock and Buchanan Farms, Oil Creek, Pennsylvania.

Indian Rock Oil Company of New York, operating on Oil Creek, Pa. Officers: G. A. Hoyt, President; Victor L. Conrad, Secretary and Treasurer; J. T. Briggs, General Superintendent. Operating the Miller Farm, containing 375 acres in fee simple, and the Foster Farm, 25 acres.

Central Petroleum Company, organized 1863; Officers: James Bishop, President; William H. Breeden, Vice President; Christopher Meyer, Treasurer; Austin Stevens, Secretary. Directors: James Bishop, William H. Breeden, Christopher Meyer, George H. Bissell, Johnson Letson, A. T. Stout, Frederick Prentice, Josiah Oakes, Wed W. Clark. The property of the company consisted of two hundred and eighty acres in fee simple on Oil Creek, Venango county, Pa., generally known as the "George Washington McClintock Farm," on a portion of which the flourishing village of Petroleum Center is situated.

Central Petroleum Companies.

Balance Sheet, December 15, 1865:—

	Profit and loss.
Expense account	$ 95,775 70
Labor	41,685 71
Swamp Angel lease	15,214 19
Wells Nos. 1, 10 and 14	5,151 27
Wells Nos. 2 and 3	3,567 11
Wells Nos. 4 and 5	2,147 25
Wells Nos. 6, 7 and 12	3,727 80
Fire insurance, interest, county tax and United States internal revenue tax	68,755 19
Bluff wells Nos. 8, 9 and 11	5,821 20
Well No. 13	1,389 00
Stockholders' dividends	500,000 00
Balance profits	136,128 65
Total	$879,363 07

	Profit and loss.
Oil account	$782,173 88
Rents and Bonuses on building lots	18,750 12
Toll bridge	689 07

Oil on hand in tanks December 15, 1865, 6,976 barrels. The government tax of one dollar per barrel on all oil sold took effect on the first day of April, 1865. Oil sold at the wells in April, 1865, at $5.50 per barrel. One dollar for internal revenue on each barrel left the oil at the wells worth $4.50 per barrel.

Report by Edward Fox and M. C. Martin, General Superintendents.

Germania Petroleum Company, incorporated under the laws of the State of New York, September 7, 1864; capital, $3,000,000; 600,000 shares, par value $5 each. Officers: J. F. Schepeler, President; H. Holthausen, Treasurer; Charles Throckmorton, Secretary. Main office, New York City. Leases and wells in President and Cornplanter Townships, Venango county, Pa.

M'Clintockville Petroleum Company, of Philadelphia, Pa.

Bissell, Prentice, Clark & Seeley Petroleum Association.

Oil City Petroleum Company.

Hoffman Petroleum Company.

Pennsylvania Oil Company.

Tarr Farm Petroleum Association.

Blood Farm Petroleum Association.

United Petroleum Farms Association.

Magnolia Oil Company of New York.



BOYD, BENNINGHOFF & STEVESON
FARMS, OIL CREEK, 1864 TO 1866.



BENNINGHOFF RUN OIL CREEK PA. IN 1865.
+ JOHN BENNINGHOFF HOUSE.
‡ FIRST WELL CASED WITH IRON CASING, SIZE 5⅝ IN.
X FIRST PIPE LINE TO PUMP OIL OVER A HILL



TARR FARM OIL CREEK, PA.
1864 — 1866.



FRAZIER OR UNITED STATES WELL

THE FIRST OIL WELL DRILLED IN 1865 AT PIT-HOLE CITY, PA.

GRANT OIL COMPANY OF CLEVELAND, OHIO.

THE BALTIMORE AND VENANGO OIL COMPANY.

BRIGGS OIL COMPANY.

GILLETTE OIL COMPANY.

THE RENO OIL COMPANY, was organized in 1865. C. V. Culver, President;; Galusha A. Grow, Vice President; J. H. Osmer, General Manager.

In the winter of 1864 and 1865 the United States well," at Pit Hole, was struck, and flowed, as estimated, January 7, 1865, 650 barrels per day. By this well came the famous Pit Hole excitement, which must ever stand prominent in the history of the oil region of Pennsylvania. Pit Hole City was commenced May 24, 1865, and soon the town contained a population estimated at 8,000.

At one time Pit Hole City had fifty hotels; several of them were palatial in size, and truly gorgeous in their equipment. The cost of the Chase House was over $80,000; the cost of the Morey and Bonta Houses, equally as large. It had miles of streets, lined with buildings, including banking offices, school-houses, churches, an opera-house and other appendages of a first-class modern city.

Soon the production of oil at this point decreased to a mere nominal figure; fire swept away whole streets of the town; the signs of decay were evident. A general collapse took place, and piece by piece Pit Hole City was carted away.

Commencing at Titusville in 1859, the tide of development swept over the valley of Oil Creek, and along the Allegheny River, above and below Oil City, for a considerable distance, then Cherry Run in 1864; then came Pit Hole Creek, Benninghoff and Pioneer Run—the Woods and Stevenson farms on Oil Creek, in like succession, in 1865 and 1866. Tidioute and Triumph Hill, in 1867, and in the latter part of the same year came Shamburgh. In 1868 the Pleasantville oil field furnished the chief center of excitement.

A lull took place, to be followed by the developments on the McCray Hill, at Petroleum Center, and on the Shaw Farm, near Rouseville, Foster Farm and East Hickory Center, and then the great "down the river," or lower oil field, loomed up to become the principal center of production.

HISTORY AND RECORD OF THE FIRST WELL DRILLED IN THE WORLD.

Early record can be found of it at the Salt Lick, or the "Great Buffalo Lick," as it was then called.

Between Dana and Campbell's Creek, near Buffalo and Deer Gap, now known as the "Thoroughfare Gap," five miles southeast of Charleston, West Virginia, on the bank of the Great Kanawha River, was drilled the first well to be recorded in the world. David and Joseph Ruffner began to drill a well for salt brine in 1806 and from this well we have the first record of any well in the world that a spring pole was used to drill with, and the first place in the world that any kind of drive pipe was used to case off the surface sand and gravel; and the first place to use tubing and a packer in a well.

In 1798 Joseph Ruffner, Sr., built the first brick store ever built west of the Allegheny Mountains, one-half mile southeast of the "Great Buffalo Lick," on the north bank of the Great Kanawha River, and a small village was built up and named Terra Salus, and later named Kanawha Salines, Latin names for salt. About 1820, the colored people ("negroes") began to call the village of Kanawha Salines Malden, from the fact that a whipping post had been established there to whip the refactory negro slaves. The negroes, when speaking of a whipping, called it getting mauled. After being whipped they called it Malden, meaning the whipping was done, hence the name of Malden, the oldest town west of the Allegheny Mountains in West Virginia.

The first safe used west of the Allegheny Mountains was brought over by Joseph Ruffner from East Virginia, also the first vault was brought over from East Virginia through the kindness of Mr. Chester Oaks, the present owner of the Ruffner store at Malden, W. Va. The writer in May, 1903, was permitted to examine the vault and safe and the contents. The vault is built of iron, brick and stone in the northwest corner of the store on the first floor, and the safe is on the second floor of the store. The safe is two feet wide, two feet deep and three feet long, made of very hard wood, bound with iron and locked with a very large old-fashioned padlock. In the safe the writer found a number of old books and papers, of which Mr. Oaks, the owner of the store, made the writer a present. The books and papers date from 1787 to 1856. The oldest paper is a due bill dated Terra Salus, West Augusta, Virginia, August 11, 1787, signed Joseph Ruffner. One bill is dated Terra Salus, Kan. Cont. Va., July, 1810: David and Joseph Ruffner, brothers, owe William Morris, ironsmith, for two bore edges or cutting rock chisels, ten pounds of steel each one, and ten pounds of iron each one; two bore or augur bars, one hundred pounds each, and two bore bar unions, eight pounds each, and two bore bar pins, two pounds each; for making them, twenty dollars.

WILLIAM MORRIS.

One bill dated Kanawha, Salines, Va., June, 1832, David and Joseph Ruffner to William Morris, for making one pair of bore bar slips two dollars.

August 1, 1832, received from Ruffner Brothers, two dollars for making one pair of bore bar slips.

WILLIAM MORRIS.

This is the first true record we have of the making and use of jars.

One-half mile east of Malden the writer was invited to visit the salt works of J. D. Dickinson & Co., sole makers of Kanawha salt. The capacity of the works is 165 barrels of 280 pounds each day. The founder of these, the only remaining salt works on the Great Kanawha River at this writing, was John Dickinson, of East Virginia, who located on the tract of land six miles southeast of Charleston, W. Va., in 1785. Mr. Dickinson sold all but 252 acres of this large tract of land and in 1832 drilled five wells for

salt brine and built a new salt works, which has remained the property of the descendants, J. L. Dickinson having charge since 1872, with his son, C. C. Dickinson, present manager. The wells are made to flow the water out by compressed air.

The writer next visited the site of Burning Springs, eight miles southeast of Charleston, W. Va., on the north bank of the Great Kanawha River, on a tract of 698 acres of land, the property of John G. W. Tomkins, son of William Tomkins, the original owner, who bought it from George Washington. Here is located the famous Burning Spring of which George Washington speaks in his will. George Washington visited the Kanawha Valley and Burning Springs in person in the summer of 1775. Through the kindness of Captain William B. Stevens, the gentleman that lives on the Tomkins Farm, that Burning Springs are located on, the writer was very kindly shown over the historic farm. The "Gum wood" conductors in the river and salt water springs were pointed out and their history given. The gas was lit in one of the "gums," as they are called there, while the writer made a picture of it and returned to Charleston, where he met Mr. John Tomkins, owner of the farm, and through him was introduced to Mr. Walter B. Brooks, executor for the estate of the late Dr. J. P. Hale, a very able writer and authority on the early history of salt-making on the Great Kanawha River, and through the kindness of Mr. Brooks the writer was loaned a paper on salt written by Dr. J. P. Hale in 1876. In the early days a drilling well was spoken of as a boring well.

HISTORY AND RECORD OF THE FIRST LARGE GAS WELL STRUCK IN THE WORLD.

In 1815 Captain James Wilson, who then owned and occupied the Clendenen Block House on the bank of the Great Kanawha River in the town of Charleston, county seat of Kanawha county, Virginia, drilled a well near the block house for salt water. At 400 feet deep a small salt brine well was struck and the well was drilled deeper in the hopes of getting more salt. At 500 feet deep the gas sand was struck and the tools were blown from the hole, the gas taking fire. After the gas weakened Captain Wilson had the hole filled up and the well abandoned as being worthless. This is the history and record of the first drilled gas well in America. The old well is now located near the residence of C. C. Lewis, Esq., on Kanawha street, in the limits of the city of Charleston, county seat of Kanawha county, and capital of the State of West Virginia.

HISTORY OF THE SAND DIGGINGS OF VIRGINIA—NOW WEST VIRGINIA.

On the left bank of the Hughes River, named after the first white settler who lived near its mouth, by the name of Jesse Hughes. In 1810, Bushrod W. Creel, who owned and lived on a farm of 100 acres on the left bank of the Hughes River, Wirt county, W. Va., six miles from where it empties into the Little Kanawha River, at that date was rated the best hunter and trapper on the Hughes River. While hunting on the river he discovered oil coming out of the bank. The thought came to him that the oil must be good for something. A day or two after he gathered two small bottles of it and took it to Marietta, Ohio, and sold it to Bosworth, Wells & Co. as bank oil, by whom it was claimed to cure all pains and aches that man was heir to. In a short time the oil had a greater sale than the supply. This induced Bushrod Creel to dig in the bank for oil. At ten feet deep a gravel bed was struck and in this gravel a black or dark green 27-degree gravity oil was found. This oil was bottled and taken to Marietta, Ohio, and sold by Bosworth, Wells & Co. Every spring for forty-five years Bushrod Creel would dig a new hole down in the gravel and dip and wash the oil out with water. In this way the place took the name of Sand Diggings. The first house that was built near by was built in 1849, one-half mile west of the Sand Diggings, on the Stanton and Parkersburg Turnpike. In that year (1849) gold was discovered in California, and as all the talk at the house was in regard to gold being discovered in California the house was christened California House, and the place to this day goes by that name. A few years ago the house burned down. In 1855 George S. Lemmon drilled the first well on the right bank of Hughes River, opposite Bushrod Creel's Sand Diggings. The well was drilled for salt brine by water power. At the depth of fifty feet oil, gas and fresh water were struck, and nothing more was done with the well for three years. In the meantime Bushrod Creel had dug over the gravel bed on the flats of his farm, which was found to be one hundred feet wide and two hundred feet long and thirty feet deep. This was the extent of the Sand Diggings on the Hughes River.

In 1858 C. H. Shattuck, a salt-maker and bottler of "Spruce Oil," of Tarentum, Pa., learned through a tramp the first known history of the Sand Diggings. However, the tramp didn't know or remember on what river the diggings were located, but he remembered they were near Parkersburg, W. Va. In 1859 C. H. Shattuck arrived in Parkersburg and inquired for the oil diggings, but no one seemed to know where they were located. One morning C. H. Shattuck started up the Little Kanawha River. After going about ten miles he learned from a settler that the oil diggings were about twelve miles from there on the Stanton and Parkersburg Turnpike, on the Hughes River. Mr. Shattuck arrived at the California House for dinner. That afternoon he went to the Sand Diggings and bought ten acres of land from Bushrod Creel adjoining his Sand Diggings on the Hughes River, and in a short time began to drill the first well ever drilled in Virginia, now West Virginia, exclusively for oil. The well was drilled by the lever process, three hundred feet deep, just fifty-nine days after the Drake well at Titusville, Pa., and proved to be a dry hole. At this date the Lemmon well was pumping twenty gallons of oil a day. After the death of Bushrod Creel the Sand Diggings and farm were left to John Creel, his son. In a few years John Creel

sold the Sand Diggings and farm to A. C. Dravo, of Beaver Falls, Pa., who drilled a number of wells on the farm before he died. The farm is now owned by John F. Dravo.

Sand Diggings to California House, one-half mile.

Sand Diggings to Parkersburg, W. Va., by the river, thirty-one miles.

Sand Diggings to Parkersburg by the Stanton and Parkersburg Turnpike, twenty-two miles.

Sand Diggings to Burning Springs, Wirt county, sixteen miles on the line of the upheaval.

Sand Diggings to Petroleum, on line of the upheaval, seven miles.

HISTORY OF BURNING SPRINGS, WIRT COUNTY, VIRGINIA, NOW WEST VIRGINIA.

The White Sulphur Springs induced William P. Rathbone to purchase the land which the Burning and White Sulphur Springs were located on, in 1841, from John F. Petty. The tract of land contained one hundred acres on the present site of Burning Springs, Wirt county, W. Va., on Little Kanawha River, thirty-five miles east of Parkersburg.

The first well drilled at Burning Springs, Wirt county, W. Va., was drilled by Charles Reynolds, of Charleston, W. Va., in 1842, for salt brine, on a five-acre lease from William P. Rathbone, and his two sons, Colonel J. C. Rathbone and John V. Rathbone. The well was drilled with the spring pole method, and ten months were consumed in drilling it. At 303 feet deep salt water was found in paying quantities, but owing to the large quantity of oil, commonly called Rock Oil, the well was abandoned as useless, as the oil spoiled the brine for salt. In the fall of 1859 General Samuel D. Karns, of Pittsburg, Pa., leased one acre of ground with the salt water well on it from William P. Rathbone and his two sons. In the spring of 1860 General Karns and his brother Frank tubed the old greasy water hole, as it was called. This was the well that Charles Reynolds, of Charleston, W. Va., drilled in 1842 for salt brine. After a few days' pumping the well began to pump pure oil at the rate of seven barrels a day. The oil sold at fifty cents a gallon. In 1861 was the great excitement at Burning Springs. The first wells were drilled with spring poles. During the close of 1861 the oil operators and people at Burning Springs were greatly annoyed by the Confederate army, which stole their horses and committed other acts of violence. In January, 1862 the Federal Government placed a revenue of one dollar on each barrel of oil sold, and in the same month authorized J. Cassius Rathbone to organize a regiment of men to defend the property at and about the Burning Springs. The regiment was organized and mustered into the Union army as the Eleventh West Virginia Infantry, with J. C. Rathbone as its Colonel, in February, 1862. In April, 1862, several raids were made in the neighborhood of Cairo, Petroleum, California House and Burning Springs. The houses and other buildings and a number of oil derricks were burned and the horses and cattle taken away by members of the Confederate army. In the first part of May, General Jones, of the Confederate army, made a raid on No. 18 tunnel at Cairo and fired the wooden arch in the tunnel. This was done to stop the traffic on the B. & O. Railroad, but the Union army on guard nearby drove the Confederate army back and put out the fire in the tunnel. Shortly after firing the tunnel General Jones and two thousand of his men made a raid on the people on the Hughes River, then crossed the country to the Little Kanawha River and made a raid on the town of Burning Springs. At that time Colonel J. C. Rathbone and five hundred of his men were stationed on the hill back of and overlooking Burning Springs. Before any damage was done General Jones demanded a surrender from Colonel Rathbone, with the promise that no lives would be lost. After the surrender by Colonel Rathbone to General Jones the trouble began. Houses and stores were robbed and set on fire, all the oil wells and tanks were set on fire and all the cooper shops, barrels of oil, loaded and empty barges were set on fire, and in a short time the whole river was a solid blaze of fire and burned the timber on both sides of the river for a distance of eight miles down the river. Over twenty thousand barrels of oil were burned. General Jones made the raid to keep the Government out of the revenue on the oil. The raid is known to this day as the great Burning Springs Fire of May, 1862.

NAMES OF FIRST OIL COMPANIES OPERATING IN WEST VIRGINIA.

C. H. Shattuck began operating at Sand Diggings on Hughes River in 1859.

General S. D. Karns, Sr., began operating at Burning Springs, Wirt county, on Little Kanawha River, in 1860.

J. T. Johnston & Co. began to drill for oil on the Hughes River in 1860.

Messrs. Hazlet & Co., of Wheeling, began drilling near Petroleum, Wirt county, in 1860.

J. B. Blair & Co. began operating on Bull Creek and at the depth of 160 feet, on the 16th of March, 1863, struck a thousand-barrel well.

The next large well struck was the Gilfillen well on Rawson's Run, near Horse Neck. The third large well was the Tack well of the American Oil Company, on Rawson's Run.

Sharp & McKinney, Campbell & Co. and Tack & Brasher were operating near Horse Neck in 1863, 1864 and 1865.

OIL LEASE USED AT BURNING SPRINGS, WIRT COUNTY, WEST VIRGINIA, 1855 TO 1875.

COPY OF THE WILLIAM P. RATHBONE LEASE.

One thousand dollars bonus at time of lease on one acre of land, one thousand dollars when the soil is broken. No more than one acre of ground leased to any party or company. Drilling to be commenced within sixty days after lease is drawn up. One-fourth

of all oil produced from the wells on the William P. Rathbone property to be delivered by the owner or company in iron-bound barrels, within twenty-four hours after produced, to William P. Rathbone and his sons, Colonel C. J. and John Rathbone.

HISTORY OF THE VOLCANO-PETROLEUM OIL FIELD IN RITCHIE AND WOOD COUNTIES, WEST VIRGINIA.

This field came into existence in 1860, by the discovery of a spring that produced a heavy dark green, 29-degree gravity natural lubricating oil, on the headwaters of a small run one mile south of the town of Volcano. A small town was built during the early oil excitement near this spring. The town was given the name of Oil Spring, and the run was named Oil Spring Run. One mile south of the oil spring on the same run is located the natural gas spring that burned for a number of years. Two miles south of this spring is the town of Petroleum.

Petroleum is the only railroad point on the uplift, or upheaval, between Burning Springs, near Charleston, on the Great Kanawha River, and Belmont and Eureka, on the Ohio River. Petroleum is located on the east side of the uplift, on Goose Creek, Ritchie county, W. Va., twenty-two miles east of Parkersburg, on the Baltimore & Ohio Southwestern Railroad. Two miles west of Petroleum, on the west side of the uplift on the Baltimore & Ohio Southwestern Railroad, is located Volcano Junction, of the Laurel Fork and Sand Hill Railroad. This railroad was built to Volcano, on White Oak Run, a distance of four miles north, in the early oil excitement of 1866. The road was built by the Volcanic Oil and Coal Company. W. C. Stiles, Jr., was General Manager.

The population of Volcano in 1872 was 2,500, present population 100. The railroad was abandoned in 1897.

HISTORY OF THE FIRST FLOWING WELL IN THE WORLD.

A well was struck on the Archie Buchanan Farm, at Rouseville, Pa., July 10, 1860, by Rouse, Mitchell & Brown. The well was called "The Curtis Well." It was drilled 180 feet deep with a spring pole, and flowed five to ten barrels of oil a day for fifteen or eighteen months. No tubing was used and the well was soon flooded out with surface water.

HISTORY OF THE FIRST LARGE FLOWING WELL IN THE WORLD.

This well was struck on the David McElhenny Farm, near Petroleum Center, on Oil Creek, Pa., May 12, 1861, by Captain A. B. Funk. This was the first well ever drilled to the third sand, which was struck at four hundred feet deep. After drilling into the sand sixty feet the well began to flow at the rate of three hundred barrels a day. The well was named the "Fountain Well." Total depth of well, 460 feet.

OIL MEN'S ASSOCIATION.

The first Oil Men's Association was formed and organized at Titusville, Pa., Monday evening, November 26, 1860. Colonel Edwin L. Drake was elected President; Cornelius Chase, Vice President; C. M. Allen, Secretary.

HISTORY AND RECORD OF THE OLDEST PRODUCING WELL IN THE WORLD.

George Rice Farm, Well No. 1, on Goose Run, in the town of Macksburg, Washington county, Ohio. George Rice, owner. Well drilled in 1862 to the Macksburg sand and later named the 500-foot sand. The well is five hundred feet deep and is producing three barrels of oil at the present day.



SITE OF BURNING SPRINGS
WIRT CO. W. VA.



OLD-TIME OIL SCENE NEAR
BURNING SPRINGS WIRT CO W.VA.



DRILLING WELL WITH DRILLING MACHINE.
BURNING SPRINGS WIRT CO. W. VA.



PUMPING WELL NEAR BURNING
SPRINGS WIRT CO. W. VA.



SITE OF THE SAND DIGGINGS ON THE
HUGHES RIVER, WIRT CO W. VA.

JARVIS
ENG. CO.



VOLCANO W. VA.
OIL FIELD.



OIL SPRING WELL ON OIL SPRING RUN, VOLCANO FIELD, RITCHIE CO. W. VA.



ROD POWER HOUSE
CAIRO WEST VA. OIL FIELD.



LOADING STATION AND RACK FOR LOADING LUBRICATING OIL AT PETROLEUM, W. VA.



ENDLESS WIRE POWER HOUSE
VOLCANO WEST VA. OIL FIELD.

JARVIS ENG'G CO.

HISTORY AND ROUTE OF THE UPHEAVAL OR UPLIFT OF VOLCANIC ORIGIN IN THE STATES OF OHIO, WEST VIRGINIA, KENTUCKY AND TENNESSEE

Scientists agree that at some period in the world's history there was an upheaval of some kind, which raised or uplifted the formations of the earth from two hundred to one thousand feet, and from one and one-half to fifty-six miles wide, which completely changed the character of the earth's surface. Beginning at Caldwell, the county seat of Noble county, Ohio, the first Cow Run sand is within one hundred feet of the surface. This is the extreme northwestern end of the uplift. The next town is Dudley, on Duck Creek, in Noble county, Ohio. The uplift here is one mile wide. Oil was found in the first Cow Run sand 150 feet deep. The next town is Macksburg, Washington county, Ohio, on Duck Creek. Oil was found in the first Cow Run sand at 150 feet and in the Macksburg, or 500-foot sand, and later oil was found in the Big Injun sand. The uplift is eight miles wide at Macksburg. The next town is Elba, on Duck Creek, in Washington county, Ohio. Oil was found at Elba in the 500-foot and the Big Injun sands. The uplift at Elba is ten miles wide. The next town is Warner, in Washington county, Ohio. Oil is found in the 500-foot or Macksburg sand. The uplift is fifteen miles wide at Warner. The next town in the center of the uplift is Cow Run Postoffice, on Cow Run Creek, Washington county, Ohio, the center of the Cow Run sand oil field. The oil is found in the second Cow Run sand. The uplift at Cow Run is twenty miles wide. The next town in the center of the uplift is Salama, in Pleasants county, W. Va., on the Ohio River. Oil is found in the Cow Run, Big Injun and Berea Grit sands. The uplift at Salama is sixteen miles wide. The next town on the uplift is "Horse Neck," in Pleasants county, W. Va. The oil is found in the Salt sand and Big Injun sand. The uplift at "Horse Neck" is six miles wide. The next town on the uplift is Borland, on Bull Creek, in Wood county, W. Va. The oil is found in the Salt sand. The uplift at Borland is three miles wide. The next town on the uplift is Volcano, on White Oak Run, in Wood county, W. Va. Oil is found in the Salt sand, 250 feet deep and the Big Injun, 400 feet deep, on the west side of the uplift. The uplift at Volcano is two miles wide. The next town on the uplift is Oil Spring, on the east side of the uplift, on Oil Spring Run, on the edge of Ritchie county, W. Va. The oil is found in the Salt sand at two hundred feet deep on the flats. The Cow Run sand crops out on top of the hill near the mouth of the coal mine, between Volcano and Oil Spring. The upheavel at Volcano is very plain. Volcano is on the west side of the upheaval, where the rock and earth formations dip ninety degrees to the west one-fourth of a mile, then there is a basin one mile wide between Volcano on the west side and Oil Spring Run on the east side of the uplift. The east side uplift is one-fourth of a mile wide; the rock and earth formations dip ninety degrees to the east. The next town is Petroleum, on the east side of the uplift, on Goose Creek, in Ritchie county, W. Va. One and one-half miles west of Petroleum, on the west side of the uplift is Volcano Junction. The next place is California House, on the east side of the uplift, in Wirt county, W. Va. The next place is the Sand Diggings, on the Hughes River. The oil is found in the Salt sand. The upheaval is one and one-half miles wide at the Sand Diggings. The next place is Parrish Forks, on the west side of the uplift, in Wirt county, W. Va. The oil is found in the Salt sand and Big Injun sand. The next place is Oil Spring, on Standing Stone Run, Wirt county, W. Va. The oil is found in the Salt sand, on the west side of the uplift. The next place is Standing Stone. The oil is found in the Salt sand, on the west side of the uplift. The uplift is one and one-half miles wide at Standing Stone, Wirt county, W. Va. The next place is North Branch of Burning Springs Run, on the east side of the uplift. The oil is found in the Salt sand and Big Injun sand. The next town is Burning Springs, on the east side of the uplift, on the Little Kanawha River, in Wirt county, W. Va. The oil is found in the Salt sand and Big Injun sand. The uplift is one and one-half miles wide at Burning Springs, Wirt county, W. Va. The basin is one mile wide in the center of the upheaval and it extends from Burning Springs, in Wirt county, W. Va., to a point on the uplift near Horse Neck, in Wood county, W. Va., a distance of thirty-six miles. The next town on the uplift is Evelyn, Wirt county, W. Va. The uplift at Evelyn is eight miles wide. The next town is Spencer, the county seat of Roane county, W. Va. The oil is found in the Big Injun sand. The next town on the uplift is Walton, Roane county, W. Va. Gas is found in the Big Injun sand. The next town on the uplift is Jarrett, Kanawha county, W. Va. The next towns on the uplift are Dana, Malden and Burning Springs, on the Great Kanawha River, Kanawha county, W. Va. The gas was from the Gas sand, the oil and salt water from the Salt sand. Salt is made from the brine of the salt water from the Salt sand and the Big Injun sand. The uplift at Malden is twelve miles wide. The next town on the uplift is Racine, Boone county, W. Va. Gas is found in the Big Injun sand. The uplift is sixteen miles wide at

Racine. The next town on the uplift is Logan, county seat of Logan county, W. Va. The uplift at Logan is twenty miles wide. The next town on the uplift is Burning Springs, Mingo county, W. Va. Gas, oil and salt water are found in the top of the Salt sand. The uplift at Burning Springs, Mingo county, W. Va., is twenty-five miles wide. The next place on the uplift is Martin county, Kentucky. The uplift at Prestensburg, Floyd county, Ky., is forty miles wide and takes in the oil wells near Paintsville, in Johnson county, Ky., and all the wells in Floyd county. The next two counties on the uplift in Kentucky are Knott and Perry. The next town on the uplift is Burning Springs, Clay county, Ky. The uplift at Burning Springs, Clay county, Ky., is fifty miles wide. The next town on the uplift is Barboursville, county seat of Knox county, Ky. Oil is found in the Shallow and Deep Lime formations. The next counties in Kentucky on the uplift are Whitley, Pulaski and Wayne. The next town is Sunnybrook, in Wayne county, Ky. The wells are shallow. The uplift at Sunnybrook, Wayne county, Ky., is fifty-three miles wide. The next counties on the uplift are Scott, Pickett, Fentress and Overton counties, Tennessee. The first oil field in Tennessee on the uplift is the Pall Mall, in Fentress county. The next fields in the uplift are the Bob's Bar and Lacy oil fields, in Fentress and Pickett counties, Tennessee. The next is the Overton field. This is the last place oil is found on the southeastern end of the uplift in Overton county, Tennessee. The distance from Caldwell, Noble county, Ohio, over the uplift through West Virginia and Kentucky to the oil wells in Overton county, Tennessee, is 413 miles. The oil formations on the uplift are from two hundred to one thousand feet nearer the surface. That accounts for the wells being so much shallower on the uplift than at other localities.

HISTORY OF OIL AND GAS SPRINGS.

On the farm of H. D. Foutty, two miles northeast from the mouth of Goose Creek, in Wirt and Ritchie counties, West Virginia, on the line of the upraise or upheaval, one and one-half to two miles north of the Sand Diggings, is an oil spring, located on the bank of Second Big Run, four hundred feet from its mouth, and another one at Sheep Cave, one and one-half miles north of the Sand Diggings. The oil has been seeping out from those springs since the coming of the white men to that section of the country, and the springs are seeping oil to this day.

HISTORY OF THE GREAT WILDCAT MYSTERY ON LOT 646, CHERRY GROVE, WARREN COUNTY, PENN'A.

Christ. Larsen, owner of lot, leased to Fred Morck and William Falkner, and subleased to George H. Dimick and Captain Peter Grace. Dimick and Grace started to drill well No. 1 on Lot 646 in January, 1882, and on the 11th day of March, 1882, the well was shut down and plugged on top of the sand later named the Cherry Grove sand, and held as a mystery, but, owing to the well not being properly plugged, the plugs leaked, which allowed the well to make several small flows. During this time the well was surrounded and watched by a heavy guard. This guard would not allow any person to go near the well. The plugs were drilled out on the 29th of March, when the well began flowing stronger than before, and it was again plugged and guarded as a "mystery" until May 17, 1882. In the meantime it became known that oil had been found in the well on Lot 646 and a number of wells were at once started drilling adjoining Lot 646. When the well on Lot 646 was drilled in it began flowing one thousand barrels of oil a day. This was the beginning of the great "boom of 646." A town was at once built upon the hill above the well, which was given the name of Cherry Grove. The next nearest town was given the name of Garfield, in honor of the President, and the next town that sprang up was named Farnsworth, after the owner of the saw mill, and at that time was the most exciting of all the oil regions, when every well struck was a gusher, when the Sheffield and Clarendon plank roads were covered with a continuous procession of wagons loaded with oil well machinery, household goods, provisions and merchandise. Garfield was then a busy, thriving town; Farnsworth was a raging sea of unconfined deviltry, and all were full of life and beer. The two towns had a combined population of 15,000. But it is all changed now. Garfield and Farnsworth have not over fifty souls and in history are next to Pithole, Pa. In the spring before 646 was struck the greater part of Cherry Grove township was a wilderness. The tract of cleared land on the crown of the hill was occupied by Swedish farmers who were getting a living with considerable difficulty. Two thousand feet above the sea level, nine miles from a railroad, with almost impenetrable forest stretching the entire distance, the region was as isolated and uninviting as any inhabited part of this rough country.

It was by accident that Captain Peter Grace put up a rig late in the winter on Lot 646 and began drilling a wildcat well. He intended to make his venture still farther over the hill, but could not get a lease. If he had got the lease he wanted his well would have proved a dry hole, and the solitude of Cherry Grove would doubtless have remained undisturbed to this day and beyond. Sitting at a reading room table one evening and building leaning towers with a set of dominoes, Captain Grace rapidly sketched the history of the venture which, according to accepted report, yielded him in the neighborhood of half a million dollars.

"We struck sand in 646," he said, "on March 11. She showed up strong. The well was then plugged and left under guard till March 29. On that day the plug was drilled out, and she began flowing stronger than before. There was no tankage to accommodate such a flow, and the well was being watched from the outside; so we had to plug her again. The woods were full of scouts. Our guard was in charge of Tom King, who had eight men under him, armed with guns. All sorts of rumors were afloat as to what the well was doing. One night two men approached one of the guards and offered him $2,000 for a chance to gauge the flow. The impression was becoming gen-

eral that the well was a gusher, and something had to be done to counteract it.

"At that time it was impossible for me to move without being watched. I was shadowed by scouts wherever I went.

SHOOTING THE FIRST WILDCAT WELL 646 IN CHERRY GROVE DISTRICT.

"So one night I went to Warren, Pa., and told one of the Roberts Torpedo Company's men that I wanted to see him later in a certain room at a hotel. He agreed to meet me there. When I went away I was shadowed to the hotel, and the men who were following me went into the room next to the one I had designated. The torpedo men came at the hour named, and I told them I was going to shoot 646. I especially charged them to make their arrangements for doing the work with the utmost secrecy. It was arranged that they should come down on the following night. All this conversation was overheard by the spies in the next room.

The next night, when the men started for Cherry Grove with the torpedoes, it seemed as though every body in the region knew that the well was going to be shot. Hundreds in wagons and on horseback followed the wagon down to the woods. The empty shell and the glycerin cans were taken into the derrick. Our lanterns showed these movements to the hundreds who were watching at a distance. The contents of the cans was poured into the shells—but the cans had contained nothing but water. Then, with the torpedo reel, the shells charged with water were carefully lowered down into the plugged well. While we stood around the hole an iron was rattled in the casing head to imitate the sound of the falling slug, and then one of the men in the derrick struck the anvil a powerful blow that faintly jarred the ground. It happened that just then the well made a little flow.

"The news spread in the crowd that 646 had been shot and had failed to respond except with a very feeble flow. The motions of shooting the well had been gone through with so faithfully that one of the men who had been on guard outside declared when he came into the derrick that the smell of glycerin made him sick, but there hadn't been an ounce of glycerin in the woods. Before morning the news was all over the oil region that the Cherry Grove wildcat had been shot and had proved to be little better than a dry hole."

OPENING THE WELL.

The well was not opened till May 17. Meanwhile it had become known that a pool had been struck which was likely to produce a tremendous sensation in the oil region, and operators eager to secure the lease of lands had begun flocking to Cherry Grove. Much of the land in that township was held by large tannery companies, which were getting out bark and lumber. The owner of the land on which 646 was drilled was a Swede named Chris Larsen. It was leased by Morck & Falkner, from whom George Dimmick, Captain Grace's partner, secured the lease before the well was begun. In February, when the well was drilled to the depth of some eight hundred feet, Larsen gave them notice to quit, the lease having expired. A compromise was effected, by which Grace & Dimmick obtained the oil right. It was said that they gave him $55 an acre; but he finally secured other advantages which netted him some $20,000 before the first of June. A few other farmers made small fortunes out of their oil lands. One made enough money to enable him to buy a good farm in New York State; but the history of the Cherry Grove excitement furnishes no stories of poor land-owners waking up to find themselves millionaires. Things are done differently now than they were in the early days of oildom.

The growth of Cherry Grove as an oil field was rapid. Before the close of May eight wells were drilling, and sixteen other rigs were building. June had not ended before six wells were flowing, sixty-three were drilling, and work was doing on nearly a hundred rigs. In the middle of that month the four wells then completed were pouring out some 10,000 barrels of oil every twenty-four hours. The close of July saw fifty-six producing wells, 163 drilling wells and 114 others up. At the end of another month the number of flowing wells was 161, of drilling wells 116 and of rigs 46; and the production for the month averaged about 28,000 barrels a day. Within a little more than three months from the time of opening the first well, Cherry Grove had become the greatest oil-producing tract in the world. But August proved to be the great month in the history of Cherry Grove. In September the daily flow dropped from nearly 28,000 barrels a day to only a little more than 3,000. The story of the decline of the Cherry Grove wells is told by the monthly record of dry wells drilled and the decrease of the average production per well. In July two dry holes had been opened, and in August the number reached seventeen. The total number of wells finished in September was comparatively small, and only two of them proved to be dry. But there were eleven more dusters in October and three in November. The average daily production per well had greatly fallen off before the producers began to find dry wells. In June it was over 1,200 barrels, in July a little over 300, in August about 150, in September 30, in October 13 and in November 10.

THE OPENING OF THE CHERRY GROVE POOL.

The area of oil-bearing sand was small and there was only so much oil to be got out of it. In the early days of oil producing, before men learned how to put down wells quickly and make the most of an opportunity, the life of Cherry Grove would have run into years, instead of being numbered by weeks. Producers soon suspected what was the nature of the field. Wells were put down with the greatest haste, for it was known that the producers who got down to the sand first would get the most oil, and that those who were late would get left. When the wells already down began to decline their owners went into reckless torpedoing, and the end of Cherry Grove as a profitable oil field was thus hastened. The field is wholly outlined by dry holes.

The oil market was seventy-three cents a barrel when 646 was struck, and dropped to sixty-five cents. Bradford, Oil City and Titusville Oil Exchanges sold the most.

HISTORY OF THE WOODEN OIL TANKS.

The first tanks used in holding oil were not the truncated cone-shaped ones, bound by iron hoops, which in later years came into general use, but rectangular boxes, held together and made liquid-tight by clamps fastened by keys.

The object of the foregoing minute descriptions is to put on record an accurate account of the methods employed in the early days of Petroleum production. The first tanks used were 10, 20, 25, 30, 50, 60, 75, 100, 200 and 250-barrel tanks. In the early days of the oil development the tanks were nearly buried in the ground, not over one or two feet being above ground, and the decks on the tanks were covered with sods and ground. This was done to protect the tanks from the weather, but owing to the great trouble with the tanks leaking the underground method was given up and the new method of making a grade on the surface was adopted and came into general use. At a number of the refineries and at central points in the oil fields in the early days dump stations were built, where the oil was run from the barrels to the tanks, but in a short time the pipe lines came into general use in carrying the oil and the dump stations quit business. The tanks at the present day are built on a level surface grade, and after the well connections are made and the pipe line is connected to the tank a square wooden house is built over the tank to protect it from the weather. The tanks mostly used at the present day are 100, 250, 600, 800, 1,000 and 1,200-barrel wooden tanks.

EARLY HISTORY OF THE POLECAT RUN WELL AND THE DISCOVERY OF OIL IN THE WORLD-FAMOUS SISTERSVILLE, W. VA., BIG INJUN SAND OIL FIELD.

William Wheeter and L. M. Ludwig, of Ottawa, Ohio, met by appointment Joshua Russell, McCormick and Morrison, George Stocking, John Dare, Joseph Shook, Thomas Lowery and Eveline B. Russell, at the McCoach Hotel, now the Mercer Hotel, in Sistersville, W. Va., in the fall of 1889 and leased their farms, which contained about two thousand acres of land, for oil and gas, the property-owners to have one-eighth of all oil produced. In January, 1890, a location for a well was made on the farm of Joshua Russell, on Polecat Run, one and one-half miles north of Sistersville, W. Va. The name of the company was Wheeter, Ludwig & Ihrig. This company gave Robert E. Mooney, a rig-builder from the Lima, O., oil field, a one-eighth interest in the leases for furnishing and building the rig for the well. In February, 1890, Mr. Mooney began to build the rig. The day they began to build the rig William Wheeter, a driller, and senior member of the company, was wound up in the slack of the cable around the bull wheel shaft at a well he was drilling near Ottawa, Ohio, and was killed. The rig was finished the last of February and in March, 1890, drilling began. The first week in July, 1890, oil was found in the top of the Big Injun sand and the well began to fill up. After running the second screw it was discovered that the well was filling up with salt water. After the soft sand was drilled, which was about twenty feet, the well was shut down until a string of rods and two-inch tubing could be shipped from the Lima, Ohio, oil field. The rods and tubing arrived at Sistersville in the latter part of August, 1890, and in September the well was tubed and roded. After pumping the well three weeks it was discovered that they could not exhaust the water. Then the well was shut down until spring, with the full intention of casing the water off in the Big Injun and drilling the well down to the Gordon sand. At that date the hundred-foot sand oil field in Butler county, Pennsylvania, was at its height, producing 1,000 barrels of salt water to 100 barrels of oil.

L. M. Ludwig heard of the large tubing being used to pump the wells in the hundred-foot oil field in Butler county, Pennsylvania, and paid a visit to the field. He returned to Pittsburg and ordered a four-inch string of tubing and rods for the Polecat well. The well was tubed and pumped a three-inch stream of salt water for six months before a show of oil could be seen. At the end of eight months the well was making ten barrels of oil a day, and after two years' pumping the well was flowing thousands of barrels of salt water and four hundred barrels of oil. The drillers on the well were Harry Ihrig and Ed Wheeter.

In 1891 Captain J. T. Jones and a number of other producers began to drill across the Ohio River on the Ohio side opposite Sistersville.

The first oil turned into the pipe line and sold in the Sistersville oil field was from the F. and C. Russell Farm, well No. 1, Captain J. T. Jones owner, August 28, 1891.

Early in 1892 the town lot excitement struck Sistersville, which was the beginning of the great Sistersville oil boom, and in less than two years wells were drilled that proved the Sistersville oil field was more than twenty miles long and ten miles wide. In the meantime the Wheeter heirs had an executor appointed to look after their interests, for some unknown reason. L. M. Ludwig and Robert E. Mooney would not pay any attention to the interests held by the Wheeter heirs and Harry Ihrig, but went on operating the property under the name of Ludwig & Mooney. This soon brought on one of the largest suits at law ever held in West Virginia. Judge Jackson, of the United States Court for the district of West Virginia, was appealed to for an injunction restraining Ludwig & Mooney from further operating the leases. Judge Jackson granted the injunction and appointed C. H. Shattuck, of Parkersburg, receiver, pending the trial. About six months after Mr. Shattuck was appointed receiver he got Ludwig & Mooney, Harry Ihrig and the Wheeter heirs to compromise their suit. Ludwig & Mooney paid Harry Ihrig and the Wheeter heirs' $120,000 for their interest and $30,000 for the receiver's and the lawyers' fees. One year later Ludwig & Mooney sold

this lease to the Carter Oil Company for $450,000. In less than two years the Carter Oil Company sold $500,000 worth of oil from the lease. The Polecat well No. 1 is producing twenty barrels of oil at the present day.

HISTORY OF THE USE OF THE FIRST BULL OR TUG ROPE ON WELLS.

The use of the single bull rope was invented and first used by Charles Reynolds, a Kanawha salt driller, in 1828, at Burning Springs, Kanawha county, W. Va.

The invention of the second or use of two bull ropes was by John Rumbaugh, Superintendent of the Washington Oil Company, at Taylorstown, Pa., in April, 1891. The two bull ropes were first used on the E. Ely Farm well No. 2, Washington Oil Company, Taylorstown, Pa., to drill to the fifth sand. The Union Drilling Company were the contractors. The drillers were William Cummings and S. W. Munn; the tool-dressers were Samuel Cruthers and the writer of the Oil Well Driller Oil and Gas History.

Mr. John Rumbaugh is now Superintendent for the South Penn Oil Company at Salem, W. Va.

The three bull ropes were first used at the deep well of the Forest Oil Company at Elizabeth, Pa., in 1897.

HISTORY OF THE FIRST ELECTRIC POWER STATION.

The first electric power station built to pump oil wells in the world was erected on the Andrew Ernest Farm, Finney Station, Washington county, Pa., four miles west of Washington, Pa. Echo Oil Company and Joe Akin, owners; built in 1895; one-story wooden building, 20x30, used for the power-house; 25-horse-power gas engine and electric generator of 900 revolutions and 500 volts. Twenty-two wells are connected with the plant and six wells are pumped at one time. A 20-horsepower motor is placed in the engine-house of each well. It can pull rods and tubing by electricity. Two men in charge of power—F. P. Criswell, electrician; Charles McWreath, pumper. Present owners, South Penn Oil Company.

HISTORY OF THE HOODOO WELL.

L. G. Robinson well No. 1, Folsom, Wetzel county, W. Va.; J. E. Carnahan & Co., owners. Drilling began January 12, 1901. Plugged the first hole March, 1901, and moved the rig and began drilling on the second hole April, 1901. Plugged the second hole and moved the rig the second time July, 1901. Began drilling on the third hole August, 1901. In November, 1901, oil was struck in the Gantz sand, 3,005 feet deep. The well was estimated to produce five barrels of oil a day. From the Gantz sand the well was drilled deeper, and in January, 1902, at the depth of 3,233 feet and only twenty-seven feet from the Gordon sand, the slate cave near the Gantz sand caved in on the tools and was the cause of a fishing job that lasted over one year. Seventy-five different drillers and tool-dressers worked on the well. The tools were fished out of the last hole fifty times; rig moved twice; wore out twelve Manila cables, three wire cables, one new engine, three new belts, five sets of bull wheels, two band wheel shafts, two band wheels and three sand reels; used 405 pails of tallow and five barrels of engine oil; profane words used on the well, 1,000,000; quotations from the Bible used on the well, none, Gordon sand, 3,260 feet; total depth of well, 3,270 feet; finished well February 10, 1903; well produced first twenty-four hours, 15 barrels of oil. J. E. Carnahan & Son, contractors. Cost of well, $40,000.

Carnahan, Robinson & Smith sold their leases, including the Hoodoo well, in the Folsom district, in 1902, to the South Penn Oil Company, a branch of the Standard Oil Company, for $1,000,000.

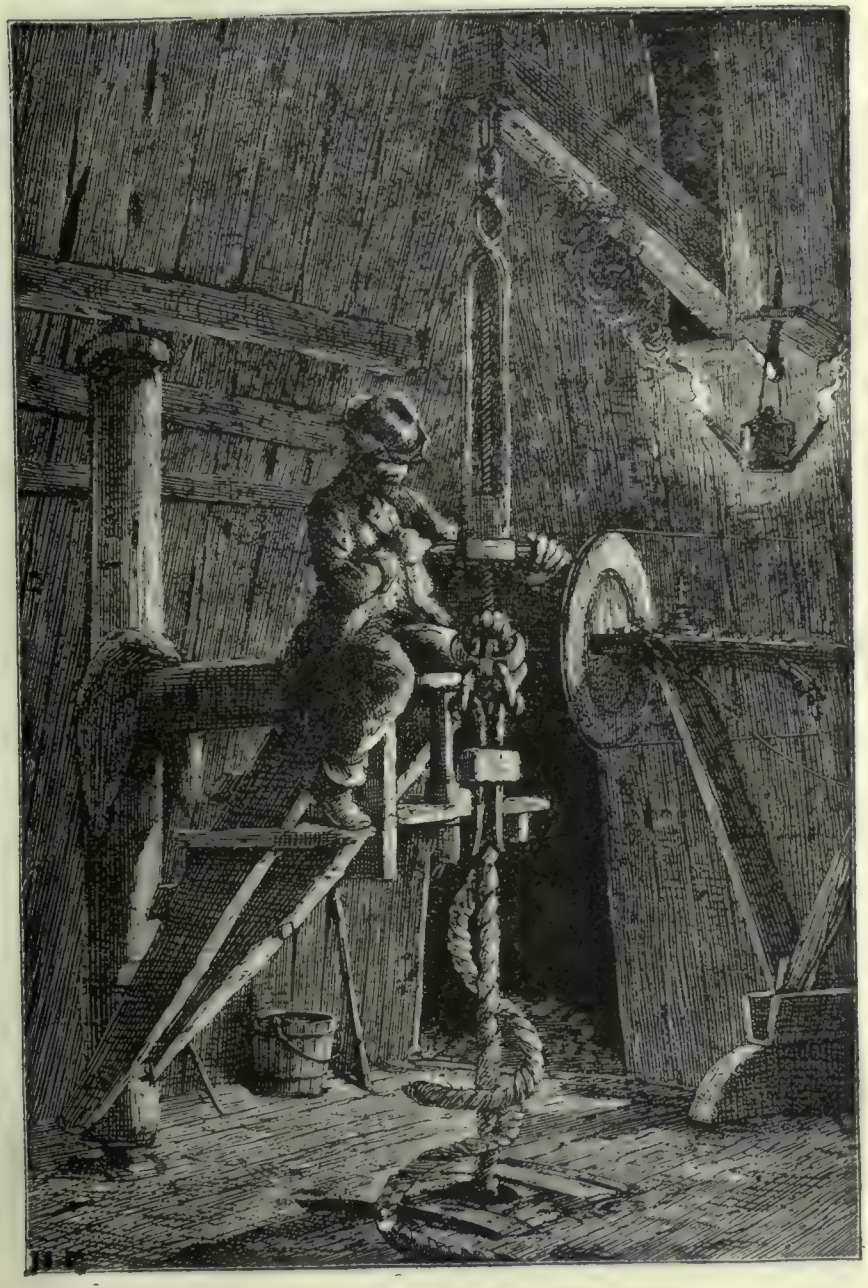
That the reader may more fully understand the workings of an oil well, the writer deems it proper to go back and review the early history and explain the several methods of drilling wells from the earliest history of the salt works on the Great Kanawha River, in West Virginia, to the present day.

Beginning with the spring pole, or kicking-down appliance, which consisted of a spring pole large enough in size and strong enough to lift the tools and an attachment at the small end of the pole, which held the tools suspended vertically. The large end of the pole was fastened firmly to the ground by stakes driven in a figure "X" over the end, while blocks and forks of trees, eight to ten inches in diameter were used as a fulcrum upon which the pole midway rested. The tools were hung to the small end of the pole by a chain or rope, so as to have in the suspension free play, in order to get a strictly vertical line for the tools in their descent. Attached to the upper end of the rope or chain was a flat piece of solid hard wood, which passed upward through a corresponding flat mortise in the pole. This piece of wood was bored with holes perhaps an inch apart or more, a strong movable pin passing through one of these holes supporting on the top of the pole the entire string of tools. As the tools descended into the hole they were gradually lowered by drawing out the pin and slipping it into another hole higher upon the stick. When the last hole in the perforated slat had been used a short joint of rods was inserted between the swivel eye and the lower rods. The lower end of the chain or rope was attached to the swivel eye, while the upper end passed over the top of the perforated slat and was fastened to the pin used in the holes of the slat attached to the spring pole. When the last hole of the slat was reached the second time a longer joint of rods was substituted for the shorter ones used. Then, as was the practice at first, a string of rods, piece by piece, was screwed together from the top of the tools to the swivel eye attached to the chain or rope that was attached to the spring pole. This was repeated until the well was finished. The rods used to drill with were round, four squared and six hexagonal one inch to two inches in diameter, ten to twenty feet long, with three-fourths to one and one-half-inch six-thread streigh pin joints. The subs or short rods used were two to ten feet in length, but experiment led to the use of a strong rope instead of a string of rods to drill with. The tools were let down to the bottom of the hole, the rope was placed over the top of the small end of the spring pole and

the pole was bent down about two feet, the rope was made fast to the spring pole. When the spring pole was in its natural position the tools would be suspended about two feet from the bottom of the hole, and near the small end of the spring pole a chain or rope was attached, and to this saddle stirrups for the feet of the workmen, two or three in number. The men each placed a foot in the stirrup, with one or both hands hold of the spring pole, and by a sudden, simultaneous kick downward the spring pole was bent, letting the tools with the bit or drill drop into the hole and cut the rock, the elasticity of the pole lifting the tools back into their place. The driller stood or sat on a bench near the mouth of the hole and turned the tools forward and backward, and in this way round holes three, four, five and six inches in diameter were drilled vertically into the earth to a depth of fifty to one hundred and fifty feet. Instead of a stirrup a platform fastened on one side to a timber by a hinge was also used. To the opposite side was attached a chain or rope, connecting with the small end of the spring pole. The workmen standing upon the platform near the hinge, suddenly stepping together and throwing their combined weight upon the opposite side, bent the pole and let the tools drop, and, stepping back, the pole would raise the tools off the bottom in the hole. The men stepping backward and forward caused the pole to bend and spring back into place. This would raise and drop the tools in the hole, and in this way the first wells were drilled.

The oil operations began in Pennsylvania by the blanket process, then the skimming process and the use of oil coops to catch the oil floating on the water. Holes were dug at or near the oil springs or seeps and the oil was dipped out. A pit or hole was dug to the rock and cribbed with timbers. As all the pits or holes dug in the early days were on the flats or near some stream of water the diggers had more or less trouble in reaching solid rock, owing to the trouble with sand, gravel and water running into the hole. This led to the general use of iron drive-pipe and the three-pole derrick, with two center guide poles, pile-driver fashion. Horses were employed in raising the battering ram or maul. Horses were also used for motive power in drilling, walking in a circle or upon a treadmill, as in the old style of threshing machines. A three-inch hole was drilled with a long bevel bit, called a cheese knife. Then the hole was reamed four or five inches in diameter with a bit, according to the size of hole required. Then a round reamer was run to the bottom of the hole. In the early days no person believed that a round hole could be drilled with a flat bit. When deeper drilling was needed to reach the sand the tools and rods were made heavier. Later the slat and pin were discarded and a chain was used, leaving the tools down a link at a time. As the drilling began to scatter and the foolish notion that oil could only be found along the bottoms or banks of some running streams had been proved false and the digging of pit or conductor holes became general, a windlass with pole arms run through the shaft was used to hoist the bucket filled with earth out of the hole. After the hole was dug to solid rock, which was from ten to eighty feet deep and six feet in diameter, a plank box, eight inches square, was lowered to the rock. The conductor box, as it was called, was braced in the hole, the lower end resting on the rock in the bottom of the hole, and the top extended two to six feet above the surface. About this time the four-pole skeleton derrick came into general use. The first four-leg derrick used was the Drake well style, which was boarded from bottom to top, but owing to the derricks being so easily blown down by the numerous windstorms the Drake derrick style was very little used. The Drake derrick was thirty-two feet high and the first oil well ever drilled with steam power. The four-pole derricks were fifty feet high. At or about this time the steam engine and boilers came into general use. The engines and boilers first used in drilling oil wells were stationary, with the engines on the top of the boilers, but owing to so many fires, caused by the gas from the wells igniting from the boiler, the engines were made separate from the boilers.

After the conductor hole was dug and the conductor box put in, the derrick was then built over the conductor hole and the conductor box was sawed off even with the derrick floor. This was the beginning of spudding over the shaft "drilling." This was done by running a short old cable about two hundred feet long over the derrick. One end was spliced in the eye of the eye-box, which was screwed to the sinker. The sinker was screwed to the jars, and they were screwed to the stem. The bit or drill was screwed to the stem. It was the custom in those days to bore a double row of one-inch augur holes in a circle about three feet from the center of the conductor hole in the derrick floor. This was done to set up and to unscrew the joints on the drilling tools, which was done by placing the handle of the lower wrench against an iron pin that was put into a two-inch augur hole bored through the derrick floor and into the derrick sill, which held the wrench, the other end of the wrench was placed on the square of the tools, while the wrenching was done with the upper wrench, by placing the point of the wrench bar in one of the augur holes in the floor, with the bar against the wrench handle, about six inches above the floor. The wrench bar was made of two-inch pipe, about six feet long, with a solid tapered pin welded to the lower end. The top end was used as a lever by the driller and tooldresser. One would pull and the other push, and in this way they tightened and loosened the joints of the drilling tools. In the early days, while the other end of the cable was wrapped three times around the bull wheel shaft, in those days only one wheel was used, and that was the tug or bull-rims. The outside one had a groove for the bull rope to run in, while the inside one was used as a brace to the arms and a place for the hand pins. The space between the arms in the center of the wheel was left open for the dog or brake to drop in. The dog or brake was made of a piece of plank two by six and about fifteen inches long, one end fastened to a piece of leather or belt, which was nailed to the girt above the bull wheel. When the wheel was running ahead the arms would push the lower end of the dog out of the space, but when the wheel started backward the lower end of the dog would drop into the space between



DRILLING WELL

In the Early Days of the American Oil Industry



NATURAL GAS LIGHT SCENE IN THE EARLY DAYS OF BUTLER CO., PA.

THIS PICTURE WAS TAKEN BY GAS LIGHT AT NIGHT

the arms in the wheel and brace against the arm and hold the wheel from running backward. It was the custom then to keep the bull wheel running ahead. One end of the cable was wrapped around the bull wheel shaft three times. Two men would take hold of the cable near the shaft and by drawing the cable tight on the shaft the bull wheel would lift the tools in the hole. After the tools were lifted up two or three feet from the bottom the men would throw slack in the rope. This would let the tools drop to the bottom of the hole, and drawing tight on the cable would raise the tools. When they wished to pull the tools out of the hole they just put the end of the cable between the shaft and cable, and the wheel in turning would wind the cable on the shaft and pull the tools out of the hole. After the drillings were bailed out of the hole the tools were backed down on the bottom. The two men would take hold of the cable, and the bull wheel would be started ahead and the men would pull and slack the cable. This was called spudding over the shaft. The wells were drilled fifty to two hundred feet in this style of drilling. In a short time the grasshopper walking beam came into use, and the left-hand, three-foot long, one-inch temper screw came into general use, and about this time the brake wheel and brake was invented. This was the beginning of the use of bull wheels with a brake and bull rope throw-off. After ten years' use of the four-pole derrick and grasshopper walking beam, the 72-foot standard four-legged, two by eight-inch hemlock plank legged derricks, with seven stories of girts and braces, and the walking beam attached in the middle to the Samson post, with band wheel, tug pulley, crank and shaft, and sand reel, came into general use. At the beginning of this style of rig the right-hand thread sash temper screw was invented. The screw was one inch in diameter and four feet long. On the lower part of the screw was attached a double handle bar and under the handle bar was the yoke, under the yoke were three washers for the yoke to turn on, and under the washers was made a ball end on the temper screw. Two holes were drilled in the yoke, one at each end, and in these holes two links were welded, and to these links were attached two clamps, one to the C, with handle bar to tighten the clamps to the wrapper on the cable, while the upper end of the screw sash was made with an eye welded to it. At this time a two-inch iron hook was used which was made with threads and nut and was bolted through the end of the walking beam. To this hook the eye of the temper screw was attached. After a short time the two-inch solid iron tee hook was invented and used by cutting a slot in the end of the walking beam, with the tee part resting on the top of the beam and the hook part beneath, to which the eye of the temper screw was attached.

At that date the two-inch straight pin and box on the drilling tools was used. The first conductor spudded in without digging a conductor hole was in the Bradford oil field in 1878. This was the beginning of the use of the hexagonal and octagonal conductor, which took the place of the square conductor. In 1879 the round iron circle was invented for wrenching and unwrenching the tools. After one or two years' use of the round iron circle the half-circle came in use and was generally used about ten years.

In 1880 Jonah Smith, a contractor, first used the taper pin and box to drill with in the upper Glade oil field, in Warren county, Pennsylvania. The taper joint is now universally used in all parts of the world.

The Barrett and Forgie jack and circle was first used in the Washington, Pa., oil field, in 1887. This is the universally used wrenching jack and circle on drilling wells at the present day.

The tee temper screw came into general use in 1880.

HOW A MODERN OIL WELL IS DRILLED.

The modern methods require a wooden derrick eighty-two feet in height and a walking beam, bull wheels, band wheel, crank and shaft, sand reel, boiler and engine, engine bull wheel, forge and belt-houses, and a set of drilling tools. Drilling tools proper consist of a rope socket, jars, stem and bit. The rope socket makes the union between the tools and rope; the jars are two long links united and are used to give the tools a jerk when they are fast; the stem or augur bar is the long weight that drives the bit or drill into the rock; the bit or drill is the lower section of the drilling tools, and is made of very fine steel; the bit is dressed with a bevel and tempered to drill hard rock. The whole string of tools is about sixty-five feet long; the weight of the big-hole tools at the beginning of the well is three thousand five hundred pounds. As the hole is reduced in size the weight of the tools is also reduced.

At the completion of a well twenty-eight hundred feet deep the tools weigh two thousand pounds, and the cable or rope four thousand five hundred pounds, and is two and one-fourth inches in diameter. Attached to the rope socket of the drilling tools is a cable or rope, called the drilling line; the cable passes over the "crown pulley" on top of the derrick, so as to allow the tools to swing in it clear of the floor near the ground; the other end of the cable passes over the "crown pulley" down the back of the derrick to the "bull wheel shaft." The cable is wound around the shaft to raise the tools out of the hole by a movable rope, called the bull rope, that passes on the outside of the left-side bull wheel, which is called the tug wheel. The bull rope passes around the bull wheel in the back of the derrick and around the tug pulley on the band wheel, which is in the belt-house; the bull rope is crossed in the middle to give the bull wheels a forward motion; the band wheel is operated by a belt from a twenty-horsepower steam engine in the engine-house; the steam is furnished by a twenty-five-horsepower boiler located near the engine-house.

The first work on a drilling well after the rig has been built (the rig is the derrick and all the woodwork about it, and is built by rig-builders or carpenters), the rigging up or getting ready to drill is done by four men—two drillers and two tooldressers. After the well is rigged up and ready to start, the first drilling is called spudding, and is started from the surface of the earth, or, in other words, from the top of the ground. To begin spudding, one end of a rope jerk-

line is attached to the wrist pin in the crank on the shaft of the band wheel, while the other end is attached to the cable near the bull wheel shaft. The cable runs from the shaft which the cable is wound upon up to and over the "crown pulley" on the top of the derrick and down to where it is attached to the rope socket on the stem; the stem is attached to the bit or drill, the crank revolving in a circle, giving the tools an up-and-down motion. The motion is regulated by the engine, while the hole is made by letting down the tools with a brake on the bull wheels.

In most places the well is spudded to the solid rock, and wooden conductor is put in to keep the surface ground from falling in the hole. In some places drive pipe is used to case off the quicksand. A short old cable is used to spud the well one hundred and fifty feet deep; the old cable and jerk-line is taken off and a longer and better cable is put on; then the walking beam is put to use. The walking beam used in drilling deep wells is a solid oak timber sixteen by twenty-nine inches and twenty-seven feet long. The walking beam is attached in the middle to an adjustable saddle; the saddle is fastened to the upright timber called the "Samson post," which is sixteen by sixteen inches, and fourteen feet long. The other end of the Samson post is dovetailed and is locked into the main sill by a large wooden key. The main sill is twenty by twenty inches and thirty-one feet long, which is fastened to the derrick and mud sills, which are the ground foundation of the rig. On one end of the walking beam is the temper screw and clamps which attach to the cable or rope; at the other end of the beam is a pitman, which is connected to the wrist pin in the crank on the shaft of the band wheel. The crank, revolving in a circle, gives the pitman and walking beam an up-and-down motion, which raises and drops the drilling tools in the well. When they first begin to use the walking beam this is called "hitching on" in oil country parlance.

To begin drilling, nearly one barrel of water is run in the hole, then the tools are started into the hole, and are governed by a brake on the right-side bull wheel, called brake wheel. The tools are run to the bottom of the well and stopped by the brake. The lever of the brake is handled by the driller; the engine is stopped with the crank on the upper center; the walking beam is raised up high enough so that the pitman can be coupled to the wrist pin in the crank, while on the other end of the beam the temper screw is raised up into the sash by an elevator rope over small pulleys under the walking beam by weights, and the clamps are fastened to a wrapper on the cable; the brake is thrown back and slack cable is run off the bull wheel. The slack is pulled down near the temper screw and tied back to the side of the derrick. The engine is started; this gives the walking beam a rocking motion, which raises and drops the tools in the bottom of the well. This is kept up until all the screw is let out, which is five to six feet long. The water is used to mix up the rock which the bit or drill cuts up; this sediment is called drillings. After the screw has been run out and five or six feet of hole has been drilled, The bull rope is put on the bull wheel and the slack cable is pulled up and the temper screw and clamps are unhitched from the cable; the pitman and walking beam are unhitched from the wrist pin and lowered to a pitch of forty-five degrees; this clears the other end of the beam and temper screw from the hole. The engine is started and the tools are pulled out of the hole, and the bull rope is thrown off; the bailer or sand pump is run into the well. The bailer is a tube about twenty-five feet long made of soft iron, with a dart valve on the bottom and a bail on the top; to this bail is attached a wire or rope sand line, which runs over a sand shive at the top of the derrick, then down to the sand reel back of the band wheel. One-half of the sand reel is outside of the belt-house; on this end is coiled the sand line, which is kept in place by arms on the reel and supported by a tail post; while on the other end of the reel is the friction and back brake pulleys. The reel is held in place by a swing lever; one end is fastened to a pin in the knuckle post, which is fastened to the main sill; the other end of the swing lever is attached to a reach, which goes into the derrick, and is attached to a hand lover and clevis on the floor, and is operated by the driller.

Pulling the lever forward pulls the friction pulley against the band wheel and pulls the bailer out of the hole; holding the lever a little past center lets the bailer down in the well; pushing the lever back throws the pulley on the back brake and stops the reel. The bailers vary in size according to the size of the hole; the bailer or sand pump lifts the drillings out of the hole and is emptied or dumped through a hole in the derrick floor called a dump hole. The drillings accumulate under the derrick and some are carried away by water. After the hole is bailed out water is again put in and the tools are run in and hitched on as before; this is repeated until the well is completed. At the beginning of one of these wells a sixteen-inch hole is started, the wooden conductor is put in this hole, which is about twenty feet deep. The hole is reduced to thirteen inches, and from two hundred to fifteen hundred feet of ten-inch casing is put in to shut off water and caves; the hole is reduced to ten inches, and from eight hundred to two thousand feet of eight and one-fourth-inch casing is put in to shut off the lower caves. The hole is reduced to eight and one-fourth inches. From fifteen hundred to twenty-two hundred feet of six and one-fourth-inch casing is put in to shut off the salt water.

This size hole is usually drilled through the oil sands. Near the center of the hole on the derrick floor is placed a circle and jack and two wrenches, to set up and unscrew the tools. Two bits or drills of the different sizes of hole are used; while one bit is on the stem at the bottom of the well the other is in the fire in the forge heating, or is dressed and setting in the slack tub where the bits or drills are tempered. The bits are heated in a forge on the right side of a derrick with coal or coke. The blast used to blow the fire is from the bellows at the side of the forge. At some of the drilling wells natural gas is used to heat the bits, which are very heavy and are handled by a crane and endless chain; they are dressed by placing one end on the floor against a stoving post, while the hot or beveled end rests on a large anvil and is



+ LOCATION FOR A NEW WELL



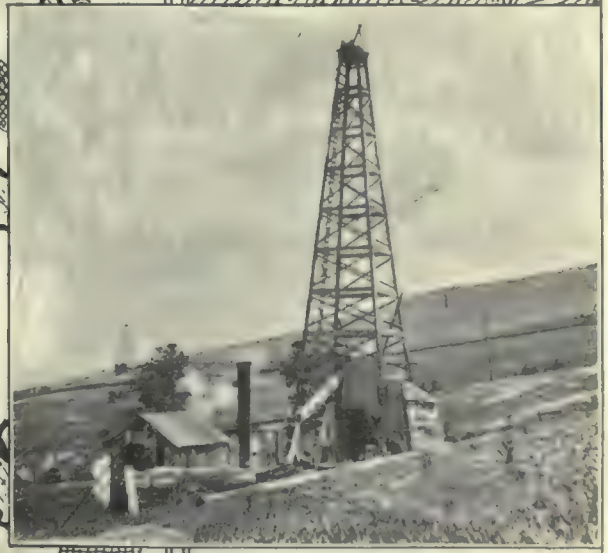
BUILDING DERRICK FOUNDATION



BUILDING OR RUNNING THE DERRICK



TOPPING OUT RIG OR DERRICK



SPUDDING WELL McDONALD PA. OIL FIELD

dressed with heavy sledge hammers by the driller and tooldresser. The bits are dressed to a uniform gauge, according to the size of hole being drilled.

A drilling well is run steadily night and day; two men are on tour together. One is the driller and the other is the tooldresser. The driller is the engineer and does the drilling, and the tooldresser is the fireman and blacksmith and does the tool-dressing. The morning tour men begin their work at midnight and are relieved at noon; the afternoon men begin their work at noon and are relieved at midnight. The number of bits or drills dressed on tour vary greatly, according to the kind of drilling. In slate, one bit; in lime, one or two bits, and in sand, five or six bits. From ten to sixty feet are drilled on tour. Before the oil sand is reached the outside casing, the eight and one-fourth inch and the ten-inch casing is pulled out to be used on other wells. When the top of the oil sand is reached, drilling is stopped. The well is measured, the oil saver and casing head are put on and connections are made to the tank, which holds about two hundred and fifty barrels. After this is done drilling is again resumed. If the well is a good one it will fill up with oil or flow into the tank; if it is a small well it is shot with nitro-glycerin, and if it is a dry hole it is a total loss to the owners; the casing is pulled out and the hole is abandoned, and the rig is taken down and moved away.

REPORT TO THE COMMISSIONER OF AGRICULTURE, DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C., FOR THE YEAR 1863.

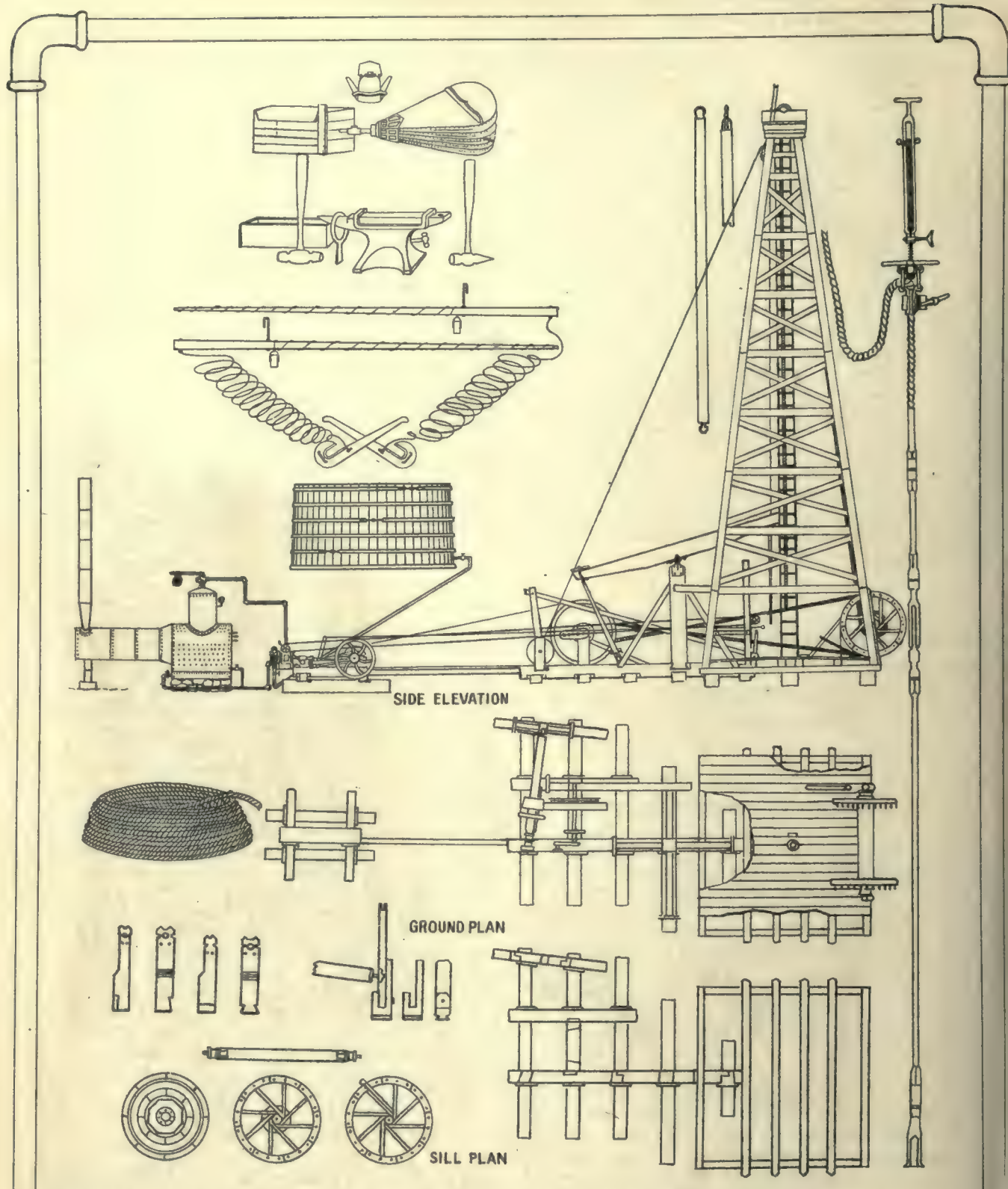
BY C. H. SHATTUCK, PARKERSBURG, W. VA.

Animal oils, rushes, resinous knots even nutshells, and other substances, have been used at different times as light-producers. It is not necessary, however, in this article to dwell on obsolete illuminations except as they incidentally exhibit to better advantage the important position which petroleum, as a light-producer, occupies before the world. The large quantities of this substance now consumed invest every place in which it is found with an importance corresponding to the amount produced. Even a cursory examination of this subject will excite no little wonder at the great productiveness of some of the oil regions of this country; and it will also strike the observer with surprise when he remembers the tardiness with which the wealth of these regions was developed. It would have been hard to have convinced, six years ago, even the least skeptical on such subjects, that today we would have wells right in our midst yielding thousands upon thousands of gallons of oil daily.

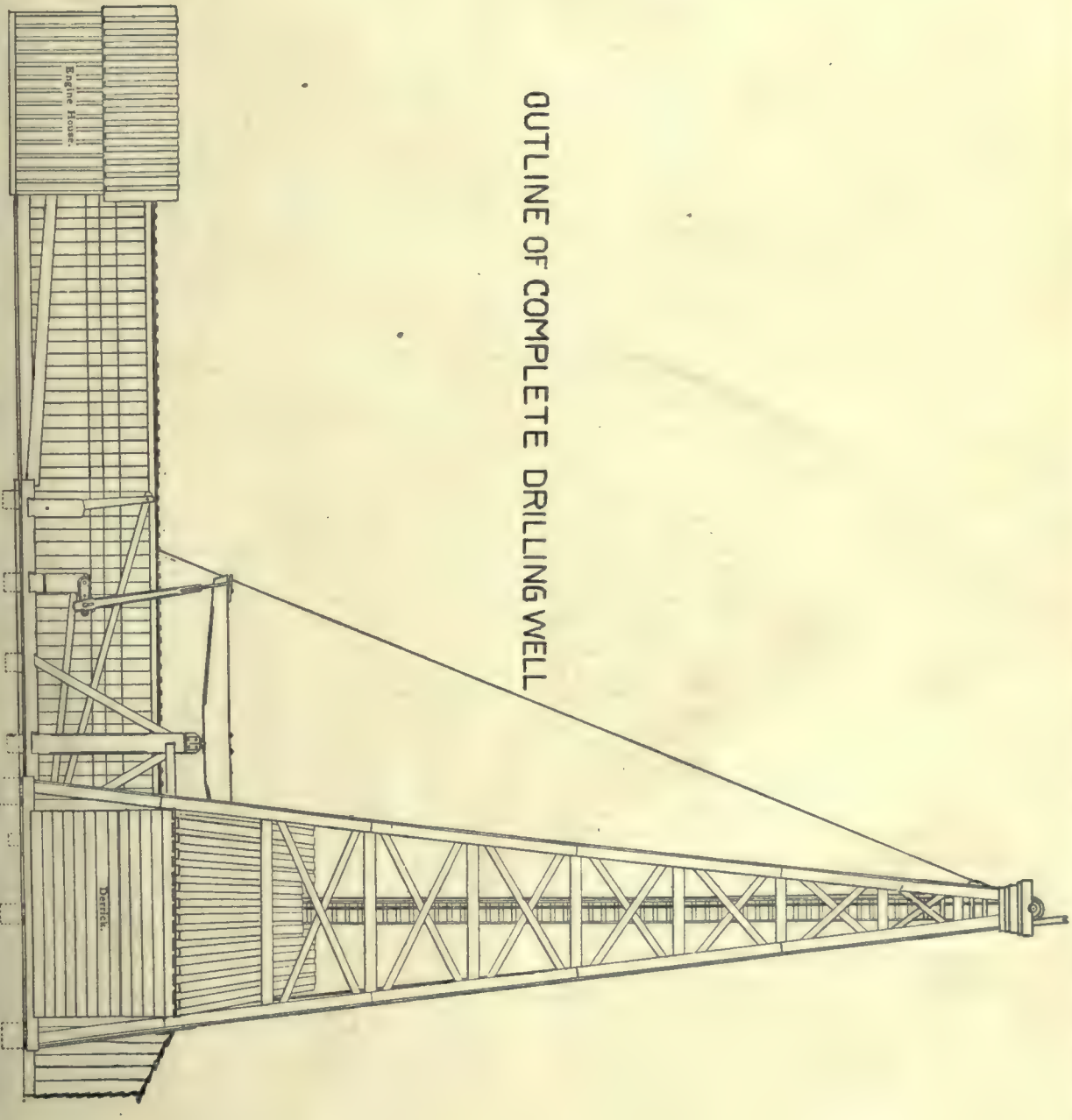
The history of petroleum in America commences in Indian times. The early settlers in this country found the Indians using it for medicines, for paint, and in their religious ceremonies. But whatever may have been the knowledge and uses of petroleum in this country up to the present time it is now clear that henceforth it must hold a prominent place among the articles of commerce. It must not be supposed that the history of petroleum commences in America. As a fuel it is no stranger to the French, to the dwellers on the Caspian, nor to the Norwegians. As an illuminating agent it is fast supplanting the animal and vegetable oils. The lamps of India are fed by it; the streets of Genoa are illuminated by means of it; and there is, perhaps, no considerable city, either in the old or new world, where the new forms of lamps adapted to the use of kerosene are not found in use. Many scientific men have affirmed that the slime with which the artisans at the tower of Babel cemented their structure was composed in part of this same coal oil. The walls of Babylon were smeared with it, and the Dead Sea, which we are told burned Sodom and Gomorrah, is a basis in which rock oil is profusely accumulated. The Spaniards who discovered Tridadad, we are informed, gazed with amazement upon a lake of pure petroleum. Rock oil is found in Sicily and has illuminated its cities. Italy, France and England all have had their reservoirs of petroleum. Whether we consider either the abundance of the supply or the great comfort and benefit derived from the use of petroleum, its recent discovery in this country must be ranked with the greatest events of the age. The pumping, barrelling and refining of it will require the labor and reward the diligence of multitudes of men, and as an article for light, as well as for various manufacturing purposes, it will ever be in demand. It is well known that Seneca or rock oil has long been famous for its medical properties; little, however, did those who used it in small quantities for this purpose dream of the abundant reservoirs which slumbered so quietly in their subterranean beds. We find that no practical movement was made in search of the native article until as late as the year 1854, when a company, Messrs. Eveleth & Bissell, of New York, organized and made preparations for boring on Oil Creek, Venango county, Pennsylvania; still, it was not until 1859 that the borings proved a success. This delay was not owing to the scarcity of oil, as events afterward proved, but rather to a want of energy in pushing the work to completion, probably a lack of confidence in final success. The first well, at the depth of seventy-one feet, developed the oil; the yield at first was but four hundred gallons, but soon rose to one thousand gallons daily. Enthusiasm now began in earnest, and Titusville, a small town near the well on Oil Creek, rose from a long obscurity to great distinction. Meanwhile attention was turned in other directions, and from this epoch we date the history of the

Oil Interest in West Virginia.

With the oil excitement at its height in Pennsylvania, of course it was not long before the oil business of West Virginia began to teem with busy operations, and enterprising capitalists diligently engaged in collecting the rich stores of petroleum which were discovered in her territory. The first operators in West



DERRICK AND COMPLETE OUTFIT READY FOR DRILLING



OUTLINE OF COMPLETE DRILLING WELL

Virginia were J. T. Johnson & Co., from near Pittsburg. These parties commenced their operations on Hughes River, Wirt county, in November, 1859. They bored a number of wells with varying success. Soon afterward Messrs. Hazlet & Co., of Wheeling, began to operate in the vicinity of Petroleum (a small town and station named from the product of the region), on the line of the Northwestern Virginia Railroad. These gentlemen were more successful than the parties last named; and this same vicinity has remained one of the most prolific portions of the oil regions of this State. We are at this time unable to give accurately the yearly yield of this region, yet we know that it has been and is still very great. In the spring of 1860 Mr. S. D. Karns leases from Mr. John D. Rathbone an oil well which, in former years, had been bored for salt purposes. This well was situated on the Little Kanawha River, in Wirt county, eight miles above the town of Elizabeth, the county seat. In the hands of Mr. Karns it proved very productive, yielding from fifteen hundred to two thousand gallons daily. The oil now commanded a good price in market, and it became manifest that this region (known as Burning Spring, from a gas spring in the neighborhood) was certain to reward the labors of operators. The attention of many was immediately turned to this district, and when, in December, 1860, Mr. J. C. Rathbone bored a well and pumped from it daily from eight to ten thousand gallons of oil, the excitement became great. There were now three districts producing abundant supplies of petroleum in West Virginia. Men of all classes—mechanics, lawyers, laborers of all kinds—turned their feet in this direction, and soon became actively engaged in the business of procuring and shipping oil. All the land in the immediate vicinity of the working or producing wells, and much at a distance from them, was leased or purchased by capitalists eager to embark in the business. Buildings in the neighborhood, which had rejoiced in the name of hotel or inn, were speedily crowded to overflowing; quiet farm-houses, hitherto only humble and unpretending dwellings, were forced from a quiet obscurity to a bustling notoriety. The farms of J. C. and J. V. Rathbone soon became a city of huts. Nothing could be seen but great piles of barrels, derricks, scaffolds and cisterns; nothing heard but the puff of the steam engine, and the click, click of the drill.

The process of boring or drilling is simple. The drill generally used is about eighteen inches in length, shaped at the point quite like the hand drills commonly used by quarrymen, and corresponding in size to the well wished to be bored. This is secured to the augur stem, a two-inch round iron bar from fifteen to twenty feet long, weighing probably from three to four hundred pounds. This is raised from the rock or bottom of the well twelve to twenty inches, as the case may be, either by the application of steam or lever power, and the fall of the iron from these heights does the drilling. By the steam power the drill will strike from twenty-five to forty times per minute. Poles are attached as the well deepens. To those unacquainted the process would seem tedious; yet drilling or boring in such material as is usually found in West Virginia, from the surface to a depth of four hundred feet, will average, probably, twelve feet per every twenty-four hours. The usual diameter of wells is four inches. West Virginia now began to rejoice over her newly developed sources of wealth, and to look forward to a bright future. The "peculiar institution" of Virginia had hitherto excluded many men from her limits. Indeed, so well understood had this fact been, that many of her best men, although not generally opposed to it, regretted the domination of this power here. Yet all now indulged the hope that the day was dawning which should see, before its noon, the wooded hills and neglected valleys of West Virginia doffing their rugged garb, and putting on the robes of a thorough and expanded cultivation; and, as preliminary to this, they hailed with a welcome the coming of those who, reared and trained in the practice of active and honorable industry, should give their labor and substance to the development of the resources of their State. But these hopes were of short duration. The active efforts of those who had moved to the new field of labor were only begun when the hostile shots were fired upon Fort Sumter. There were heroes sweating and delving in the oil regions as well as elsewhere. The promises of wealth which the oil regions had made, and which now seemed about to be realized, were forgotten. Princely fortunes lost their charms when an imperiled country called her sons to her defense, and now those who but recently came to these localities to pursue the avocation of peace departed to practice the arts of war.

Operations on any extensive scale were now impracticable; and even if splendid results had not been impossible on account of a scarcity of laborers, the murderous raids of guerillas would have completed what the other began. A few who remained and endeavored to perpetuate what had been so well commenced labored on, notwithstanding the new difficulties. Yet the predatory incursions of guerilla bands made any large shipments of oil almost impossible. Nevertheless, despite all the obstacles thus interposed, and which were understood only by those who have been compelled to contend against them, there was produced at the one point of Burning Spring alone, in the year 1861, four million gallons of oil. In the year 1862 three million two hundred thousand gallons were sent to market from this same point. The product of 1863 does not, probably, exceed two millions of gallons. When it is remembered that this large amount of oil was produced in one section alone of not over one mile square, and under circumstances the most unfavorable to production, the reader may form some idea of what might be done under circumstances that would deserve to be called auspicious. It must not be supposed that in estimating the oil interest of West Virginia the small tract or point embraces the entire oil-producing district of the State. Explorations made for the discovery of oil in West Virginia, it must be remembered, had only begun three years since. The force of circumstances concentrated the efforts of explorers in the territory around this district. Oil was first discovered here in abundant quantities. People naturally flocked to this point, and before curiosity and investigation had been able to exhaust the objects of attraction here, and turn to search for new fields,

the so-called secession of Virginia, with all its baneful evils, fell like a blight upon the land. While the supply from this district was diminished to some extent, other regions, unexplored, some of which are now proving as productive, remained untouched.

These territories, from which enterprise was banished by the war, remained with all their mineral and oleangnous wealth, unrevealed, quietly awaiting the time when, without the din and perils of war, the men of toil could enter the subterraneous chambers and bring forth their treasures to the world. This period has at last arrived. Steadily the rebellious forces have been pushed and driven back until this portion of West Virginia, at least, can be said to be entirely free from them. Men begin to feel again that they are safe and sound under the old government, and with this feeling comes the revival of business. But few days have elapsed since the development of an entirely new oil district. A few months since Messrs. J. B. Blair & Co. began operating on Bull Creek, and at the depth of 250 feet, on the 16th of this month (March), they struck a vein of oil which has continued flowing at the rate of a thousand barrels of oil per day since. A curious fact connected with the oil beds here is the following: Commencing at Burning Spring, on the Kanawha River, we trace a belt of upheaving rock, causing a vein of rock some twenty feet in width to stand perpendicular on its edge, and running north one degree east, crossing Hughes River at the oil wells already spoken of; also crossing the railroad near the oil wells of Hazlet & Co., and crossing Bull Creek at the wells first spoken of, Messrs. J. B. Blair & Co.'s; thence on and crossing the Ohio River, the oil district appearing to follow, this upheaving appearing to designate where oil exists. All along this line may be found gas or burning springs. As these gas springs are an excellent indication of oil, it may be safely said that oil will be discovered the entire length of this belt, thus giving West Virginia almost treble the amount of territory to that of Pennsylvania. Already borings have commenced on and all along this line; probably there will not be less than one hundred wells sunk this season at different points yet undeveloped between Burning Spring and the Ohio River. That many will be successful cannot be doubted. Professor Rogers, in an able article on the history of petroleum, brought out last July, believes the great basin to be near the Ohio River, this State. Indeed, the large yield of the wells on Bull Creek, five miles from the Ohio River, recently discovered, would seem to be proof of this assertion. It is not intended here to discuss the theory of the origin of petroleum, nor yet its composition or gravity of the several oils obtained in West Virginia. In regard suffice to say they differ little from the Pennsylvania oils, a very able report of which we have from Prof. J. B. Lesley, just published. Indeed, these great oil-bearing districts differ but little in any respect, both being hilly, clayey soil, well watered, and with an abundance of timber.

It will be observed that the yield of petroleum here during the year 1863 is less than former years. This, however, cannot be taken as an index of the real productiveness of the region; it may be said this is all that was brought to market. In May last the Rathbone district was, together with all the apparatus, burned and entirely destroyed by the rebel forces under General Jones. Twenty thousand barrels of oil were burned with it. The losses were heavy, and, of course, were severely felt, both in material destroyed and time spent in rebuilding; had these disasters been averted the yield would have been equal to former years. We rejoice to believe that the day is now come when, in peace and without hindrance, West Virginia will be permitted to demonstrate the true extent and richness of her oil districts. The wise and energetic administration of the affairs of our State is beginning even now to tell in our behalf. The infant State is a giant even in its infancy; and when once it is able to give an undivided attention and care to its great internal interests, it will be manifest to the world that the promise of its babyhood was only a truthful augury of the prowess and splendot of riper years. The treason which once lurked stealthily or shook its gory locks defiantly among us is now skulking to its grave. Men are daily feeling more and more that traitors are infamous, and that loyalty and honest industry are the surest elements of power and progress; and we venture to affirm that when, under the effects of a general education and a wise and energetic government, the State of West Virginia fairly begins her course, she will take rank high up and far forward among her noble sisters, and will have no cause to blush when she looks at the emblems which betoken the sources of her power. When her mineral wealth begins to be developed, when her reservoirs of oil, her vast beds of coal, lead and iron ore have become known in their true character, when her facilities for refining these articles are known, and all her resources for producing have been unfolded in their full proportion, we think her sister States will not be reluctant to award honor and admiration and warm welcome to the star that last began to shine in our national constellation. Oil is brought to Parkersburg, the general oil market of the State, from Burning Spring, during the spring and fall, by flatboats on the Little Kanawha River, at a cost of seventy-five cents per barrel; other seasons, when the river is not navigable, it is wagoned at a cost of two dollars per barrel. It is well to mention here that a bill has recently passed in the West Virginia Legislature for the improvement of this river. A company has already been formed, sufficient stock subscribed, and we may expect that soon the Little Kanawha will be navigable all the year. From Hughes River and Petroleum districts the oil is hauled to points on the Northwestern Virginia Railroad at a cost of twenty-five to fifty cents per barrel, and from Bull Creek it is hauled to the Ohio River at a cost of fifty cents per barrel.

HISTORY OF HON. HENRY R. ROUSE, FOUNDER OF ROUSEVILLE, PA., AND SON OF SAMUEL D. AND SARAH ROUSE.

H. R. Rouse was born in the town of Westfield, Chautauqua county, New York, October 9, 1823; was educated in the public schools, then emigrated to Warren, Warren county, Pa., where he taught school. When oil was discovered on Oil Creek, he went to Venango county, Pa., and in conjunction with John L. Mitchell, of Enterprise, and Samuel Q. Brown, of Pleasantville, Warren county, Pa., secured a lease of the Archie and John Buchanan farms on Oil Creek, agreeing to give as a royalty one-fourth of the total product. Rouse, Mitchell & Brown started to drill a well on the Archie Buchanan farm in October, 1859, and struck a small well in the first sand. In 1860, Rouse, Mitchell & Brown sub-leased a number of acres of the Archie and John Buchanan farms to other parties, who drilled a number of small wells in the first sand. On the 17th day of April, 1861, while a number of men were gathered at the hotel waiting for their supper and discussing the fall of Fort Sumter, a man came into the hotel and reported the famous Merrick well flowing oil from the second sand. He inquired for Mr. Rouse and was told he was at Captain Dave Taylor's round top shanty near Cherry Run. After arriving at the shanty, which was about three minutes' walk from the well and opposite Franklin S. Tarbell, the tank builder's house, he found Mr. Rouse talking to Captain John B. McNair, and reported the strike to them. The men started to the well. When they reached the well it was flowing a full six-inch pipe of oil, and, though it was never fully gauged, it was estimated to flow 2,500 barrels of oil a day. The excitement was very great, parties coming from every direction to see the big well. At about half past seven in the evening of the day the well was struck Mr. Rouse and Mr. W. B. Benedict were standing on a plank near the well, watching it flow, when the gas came in contact with the fire in the boiler of the Wadsworth well about eight rods away, and a violent explosion occurred. It is estimated that three hundred persons were present when the explosion took place, which set the Merrick well on fire. When Mr. Rouse was found he was about two hundred feet from the well in a brush pile, his clothing still on fire and his eyes entirely destroyed.

Forty-two men were burned, nineteen of whom died. Twenty-three were maimed for life; nine were burned upon the spot. Two men with their valises were seen to come from the direction of Oil City just before the explosion. After the fire was extinguished the only remains of the two men were two small piles of ashes and the iron binding of their valises. At this date Oil Creek was high. A man by the name of Metz charged twenty-five cents for each person to cross the creek. All of the houses on the east side were turned into hospitals. Mr. Rouse was taken to the hotel and placed on a bed; his first inquiry was for Allen Wright, a friend and acquaintance of many years. Upon Mr. Wright reaching him, Mr. Rouse requested that a justice of the peace should be brought in, as he wished to make his will. Mr. Wright said to him: "Henry I don't know where a justice can be found." An oil operator who was standing near volunteered his services, saying he was familiar with the writing of wills. His services were accepted and Mr. Rouse, lying on his back, proceeded to dispose of his property as follows:

In the name of God, amen; I, Henry R. Rouse, being as I believe near my last moments, but sound in mind, do make this my last will and testament:

First—My executors to be George H. Dimick, Samuel D. Rouse and Samuel Q. Brown.

Second—I bequeath to my father, Samuel D. Rouse, five hundred dollars per year during his lifetime.

Third—Rouse & Mitchell hold the notes of S. A. Skinner and Allen Wright for twenty-five hundred dollars; my half I bequeath to them. They are having hard enough times without having to pay the notes.

Fourth—All the leases of Rouse & Mitchell and Rouse, Mitchell & Brown, I want to have them lease at one-half the oil; and I bequeath to them all of my share of said rent over the one-half the product of the wells, as now stipulated to be paid in their respective leases.

Fifth—I bequeath to George H. Dimick two thousand dollars for the use of himself and his mother, to be paid out of the residue when my estate is settled up.

Sixth—To John Mitchell I bequeath my black mare.

Seventh—I have the sheriff's deed of the store and dwelling house occupied by Thomas Morean. I bequeath said property to his two youngest children, Eva and Maggie; their father to have the use of it until they come of age.

Eighth—I bequeath the residue of my estate, after making some other bequests, to the Commissioners of Warren county, the interest of it to be expended on the roads of said county, after I make some other bequests.

Ninth—I have a little namesake, Henry Rouse, in East Granby, Connecticut. I bequeath to him five hundred dollars. I cannot think of his name. His mother is the daughter of Joel C. Rouse; his name is Henry Rouse Vict.

Tenth—David H. Taylor, I bequeath to him five hundred dollars.

Eleventh clause is blank.

Twelfth—I bequeath to my aunt, Clara C. Hart, five hundred dollars.

Thirteenth—I bequeath to Miron Waters five hundred dollars, to be paid when my estate is settled up.

Fourteenth—I also bequeath five hundred dollars to my hired boy, Miron Dunham, to be paid when my estate is settled up.

Fifteenth—I wish to change the object of the clause contained in No. 8 so as to give the benefit of one-half of it to the poor of Warren county. It is given in trust to the county commissioners for that purpose.

Sixteenth—To Almedia Arnold I bequeath two hundred dollars.

Seventeenth—To Joel C. Rouse, of Saratoga, N. Y., I bequeath three hundred dollars.



HONORABLE HENRY R. ROUSE.
FOUNDER OF ROUSEVILLE, PA.

1823. IN MEMORIAM 1861.

OF

HONORABLE HENRY R. ROUSE.

Hon. Henry R. Rouse was born in Westfield, Chautauqua county, New York, October 9, 1823. Died April 17, 1861, aged 37 years, from injuries received at the burning of an oil well on the Buchanan farm, now Rouseville, in Venango county, Pa., being one of the nineteen persons who lost their lives at this the first oil well fire that occurred in the oil regions. He lived but a few hours." (Copied from memorial displayed in the county commissioners' office in the court house at Warren, Pa., beneath a life-size oil painting of the Hon. Henry R. Rouse.)

The will of Henry R. Rouse, deceased, which this article is copied from, can be found in Register Docket No. 3, Page 455, of Warren county, Pa. Will recorded May 1, A. D. 1861. R. K. Russell, Register; by D. H. Waite, Deputy.

All that is left to mark the location of the Merrick well on the Buchanan farm, in the southern limits of the borough of Rouseville, Pa., where Mr. Rouse was burned, is the upper end of the drive pipe, about two feet above ground, with a wooden plug driven into the top of the drive pipe.



HOODOO WELL (FOLSOM-ROBINSON OIL FIELD)
FOLSOM-ROBINSON, WETZEL CO., W. VA.

Eighteenth—I bequeath to Mrs. Morean, wife of Thomas Morean, three hundred dollars.

Nineteenth—Two gentlemen carried me out of the fire. I bequeath them each one hundred dollars.

Twentieth—Let my funeral be without display. No funeral sermon to be preached. Bury me by the side of my mother, at Westfield, N. Y.

Twenty-first—I have a beautiful picture, an engraving, in Hempfield's store at Pittsburg; I bequeath it to William Hirst, of Meadville, Pa.

Twenty-second—I bequeath my library to my father.

Twenty-third—I bequeath my wardrobe to Mrs. Thomas Morean.

I have nothing more to add at present. I authorize all who are here present to witness the foregoing as my last will and testament.

In testimony that the foregoing is the last will and testament of Henry R. Rouse, and at his request, we, the undersigned, hereby sign the same in his presence, in Cornplanter township, Venango county, Pennsylvania, this seventeenth day of April, A. D. one thousand eight hundred and sixty-one.

HENRY R. ROUSE.
His × mark. (Physician in attendance.)

N. H. JONES,
ALLEN WRIGHT,
S. R. CHRISTY,
Z. MARTIN,
W. B. WILLIAMS,
W. H. KINTER.

After having acknowledged the will, Mr. Rouse lay for some moments in silence; he then said: "I wish to see the doctor." Dr. Christy, who was nearby attending to the other sufferers, responded at once. Mr. Rouse said to him: "I wish to know exactly my condition." The doctor told him: "Henry, you will have to die, and that very soon." His only remark to this was: "The grave; oh, how cold the grave." Then to Mr. Wright he said: "Allen, I wish you to promise me that I shall be laid by the side of my mother." Mr. Wright promised, and now the body of Henry R. Rouse reposes by the side of his mother in the beautiful cemetery at Westfield, New York.

Hon. Henry R. Rouse was burned in a horrible manner and lived only seven hours, during which time he suffered indescribable agony. In his bed of suffering he dictated a will which for conciseness and clearness of dictation is not often equalled. At the end of every sentence and oftener water had to be placed to his lips with a spoon. His lips had been burned away and half of his body was in a crisp. The will contains twenty-three clauses. When he had finished the dictation he had little strength left, and in view of his hands being so badly burned he could not sign his name, but simply made his mark. Uriah Smith was one of the men who assisted in helping Mr. Rouse out of the brush heap; the other man is not known.

List of persons burned at the Merrick well:

Burned to death—Hon. Henry R. Rouse, Enterprise, Warren county, Pa., of the firm of Rouse, Mitchell & Brown, oil producers; W. S. Skinner, Wattsburg, Erie county, Pa.; James Walker, Butler county, Pa.: George Hayes, Chautauqua county, N. Y.; Albert Gardner, Pontiac, Mich.; Judson Mason, New York State; G. W. Bentley, Harlansburg, Lawrence county, Pa.; Philander Stevens, Chautauqua county, N. Y.; one unknown man.

Badly Burned—Hon. Willis B. Benedict, Enterprise, Warren county, Pa., now resides in Titusville, Pa.; Levi Walker, Butler county, Pa.; S. Houston Walker, Pittsburg, Pa.; John Restling, Chautauqua county, N. Y.; A. D. Easton (fatally), Whiteston, Oneida county, N. Y.; Constant Burnell, Erie county, Pa.; James Perry (fatally), Utica, N. Y.; Smith Cushing, Sherman, N. Y.; Thomas Page, Mercer county, Pa.; James Smith, Venango county, Pa.; James Johnson, Mercer county, Pa.; Archibald Montgomery, Venango county, Pa.; Charles Lockwood, Michigan; Augustus Cummings (fatally), orphan boy; Joseph Buel, Utica, N. Y.; Joseph Bloyd (fatally), Utica, N. Y.; J. A. Kent, Chautauqua county, N. Y.; John Glass, Butler county, Pa. George Glass, Henry Chase, Mr. Burley and a number of others were slightly burned.

Wells Burned.

Merrick, Little & Hauley; Rouse, Mitchell & Brown; Wadsworth, Dobbs, Mason, Maxwell and Rice wells.

The Merrick well, oil burned, 1,000 barrels; Wadsworth, 500 barrels; Dobbs, 700 barrels; Mason, 40 barrels; Maxwell & Rice, 600 barrels.

John Buchanan's barn burned, with 106 barrels of oil stored in it and 60 bushels of wheat.

In the fall of 1858 Henry R. Rouse was elected by a large majority to represent Warren and Crawford counties in the Legislature of the State, and the next year he was re-elected. He spent much time, money and labor in opening and improving roads and constructing bridges in Warren county. The county commissioners serving at the time of Mr. Rouse's death were E. Barnes, Alden Marsh and M. Miles. They at once took steps to make the fund of the "Rouse Estate" practically beneficial. The amount realized, after the completion of arrangements necessary to make it available, was about $186,000. They purchased a farm of 400 acres near Youngsville at a cost of $13,500 and erected a plain two-story brick building with stone basement, the main part being 100 by 37 feet and the wing 36 by 20 feet; also necessary farm buildings, all of which constitute the property known as the Rouse hospital. Henry R. Rouse was a single man and had but few relatives, hence he made Warren county his principal legatee. As a legislator he was intelligent and trustworthy; as a citizen he was public spirited, sagacious and useful; as a friend he was faithful, agreeable and true. A costly monument was erected to his memory at Westfield, N. Y., where he is buried, which is the home of his birth, and another at the Warren County (Pa.) Home for the Poor; but his most enduring monument will be in the hearts of a grateful people who have learned to appreciate his beneficence and worth.

The Oil Fields of America

WEST VIRGINIA AND OHIO.

BY J. T. HENRY, PROF. J. P. LESLEY AND PROF. W. F. ROBERTS, 1873.

It is almost impossible to describe or rather define the limits of what is called the oil region of West Virginia. Streams which empty into the Ohio River, as far as fifty miles above Marietta, afford the usual surface indications of oil. One hundred and fifty miles below Marietta, the Ohio river touches the northeast corner of Kentucky, and, on the streams which empty into the Ohio at this point, oil is said to abound, and to have been discovered in paying quantities. From Fishing Creek, which empties into the Ohio, fifty miles above Marietta, there is a country running back from ten to thirty miles from both banks of the Ohio, that affords surface indications. Of course, the existence of oil throughout all this vast region is doubtful.

On the Ohio side of the river are the counties of Washington, Athens, Morgan and Noble, in which oil has been drilled for and found. On the Virginia side, there are eight counties—Tyler, Calhoun, Roane, Jackson, Kanawha, Wood, Wirt, Ritchie and Pleasants—in which oil has been found. These twelve counties embrace a territory which extends away from Marietta in every direction, and whose extent is from thirty-five to sixty miles. Great excitement prevailed on the discovery of oil in this region in 1860, and was followed by speculations in land and the formation of oil companies. As a specimen of the producing character of this oil territory in the early days of the business we may instance the Dutton well, on Duck Creek, Ohio, which was struck in 1860, at a depth of fifty feet, and averaged, it is said, from seventy to one hundred barrels per day for a considerable time. Another, called the Steel well, on Duck Creek, produced some five hundred barrels per day for some weeks, and in 1865 was producing five barrels per day. This well was drilled to a depth of one hundred feet. In the summer of 1864 a well called the Dixon was sunk eight hundred feet, when it commenced flowing at the rate of thirty barrels per day. The Bull Creek region, on the Virginia side, had in 1865 some forty or fifty wells. the largest of which yielded sixty barrels per day.

In 1860, when the excitement was at its height, a crisis occurred. The price of petroleum suddenly went down, until the barrels, as they came from the hands of the cooper, were of more value than the oil that filled them. Two causes led to this—the world had not learned the use of Petroleum, and the early surface wells threw forth so many barrels of oil that the supply was larger than the demand, and the market became overstocked. This disheartened capitalists, and lands fell. Then came the war. Virginia seceded and the line of the Ohio became contested ground. McClelan crossed, but his forces were too busy with the Baltimore & Ohio Railroad to think of protecting the oil-hunters, then swarming along the Kanawha. Although there was no organized army of Confederates in West Virginia, there was nevertheless a body of guerillas who were constantly harassing the country. The result was a panic. In a week the whole party left. The derrick stood in the field over the half-drilled well, the oil gushed up and overspread the ground, the houses were town down for camp-fires, and the whole enterprise perished. As soon as the turmoil of war ceased the drill was again set in motion, and operations have continued with singularly uniform success up to the present time. The present center of the oil-producing region of West Virginia is Volcano, formerly called White Oak, which consists of two narrow belts of land, only a few rods wide, running parallel with each other at a distance of about a stone's throw apart. Their direction the longest way is north, ten degrees east and south, ten degrees west. Here, within a distance of six miles in length by one in width, is embraced the whole of the West Virginia heavy oil-producing territory. Within this narrow limit is produced all the heavy lubricating oils known as the Globe, Peninsular, Grant, Hillsdale, Mount Farm, White Oak, Gales Fork, Volcanic, &c., which have become so well known in this country and in Europe. In one respect the geological formation here is remarkable. Upon either edge of these oil belts the rock, upon the surface, stands at an angle of about eighty to ninety degrees, and is precisely similar in character to the rock found in the surrounding territory at a distance of six hundred feet below the surface. While the lower stratum of rock entirely surrounds the oil belt, it is missing under it, or, rather, instead of lying six hundred feet below the surface, it here appears at the surface. The conclusion is irresistible that this belt rock once formed part and parcel of the lower stratum, and that at some period by some convulsion of nature it has been forced to the surface. We suppose it is to this circumstance that Volcano is indebted for its name. It is somewhat limited in numbers and territory, yet its productions aid not a little in making up the aggregate of the material wealth of the nation. There are at present quite a number of new wells be-

ing put down, both for heavy and light oils. The heavy oil is found at a depth of about six hundred feet, while for the lighter oils it is necessary to go down to a sand rock twelve hundred feet below the surface. The wells yield, on an average, about three barrels per day.

The territory known as the Glantz tract, and owned by the Oil Run Petroleum Company at Volcano, is considered one of the best producing tracts in West Virginia. From twenty-three wells during 1872 this company had an average production of 3,750 barrels per month, of all gravities ranging from twenty-nine degrees to thirty-five degrees. The oldest well on the tract, the Moore well No. 1, produced alone 7,735 barrels of thirty-five-degree gravity. The second well struck, the Shafer and Stein well, has produced 2,748 barrels of oil, twenty-nine degrees gravity.

A recent writer at the Ohio oil field, and particularly of the Cow Run region, says: For the encouragement of oil producers, and men interested in the production of oil in Ohio, and more especially to show that Pennsylvania is not the only oil-producing territory, I present you the following figures and data of a two-acre lease, situated at Cow Run, Washington county, Ohio. Grecian Bend Company's well No. 1, struck oil in April, 1869, at a depth of three hundred feet, and produced 966 barrels until January 1, 1870. Well No. 2 struck oil December 25, 1869, at a depth of seven hundred feet, and produced 21,985 barrels until January 1, 1870. Well No. 3 struck oil June, 1870, at a depth of four hundred feet, and produced 1,134 barrels until January 1, 1871. Besides this, the company has paid the Transportation Company over five hundred barrels charged for evaporation. This is the production of only one company. The School House Company has produced and sold, the past year, over $60,000 worth of oil. And Perkins, Harvey & Co.'s wells have produced and sold, to August 1, 1870, $212,566.33 worth of oil. This is the production of only three companies, out of a host of good companies located at Cow Run.

The West Virginia and Ohio oil fields are justly celebrated for the production of lubricating oil, which is held in great estimation in England and on the continent of Europe.

The combined production of Ohio and West Virginia for 1872, was estimated at 320,000 barrels.

In connection with our sketch of the oil region of West Virginia and Ohio, we would offer some facts in relation to the discovery of what has been termed *Crystallized Petroleum.* In noticing it we simply give the reports of two eminent scientific men—Professor Lesley and Professor W. F. Roberts.

Professor Lesley's Report.

The following report is taken from the printed proceedings of the American Philosophical Society:

Professor J. P. Lesley communicated a notice of a remarkable coal mine or asphalt vein, cutting the horizontal coal measures of Ritchie county, West Virginia.

Mr. Lesley said that, through the kindness of R. H. Gratz, Esq., of Philadelphia, a descriptive letter and a map had been submitted to him, which exhibited geological facts of more than ordinary interest to those who are studying the origin of the rock oil deposits of the West.

The curious points of the case require careful investigation, but there seems to be no good reason to doubt the essential correctness of the statement.

The coal-beds of West Virginia pass horizontally through the pronglike ridges from valley to valley. Some of these ridges run as narrow on the top and as regular as railroad embankments, for three or four miles, and in nearly straight lines, between equally straight vales terminating bowl-shaped against some cross ridge.

It is across such vales and dividing ridges that the asphaltum vein of Ritchie county makes a straight course, "2,323 feet long, as at first measured, but since then traced in both directions still further, so that now it is known to extend more than two-thirds of a mile." Explorations beyond this line have failed to find it. Its outcrop, four feet ten inches thick, was discovered crossing a ravine fifty feet wide at the bottom, and rising on each side with slopes of nearly forty-five degrees.. On one of these hillsides at a height of ninety feet the outcrop showed the same thickness, but at a height of 185 feet it was found to be but two feet six inches thick. It is not certain that this diminution is in a vertical direction; it may be lateral; for the slope between the ninety and the hundred and eighty-five feet levels is more gradual, especially upon the western side.

In the bottom of the ravine a vertical shaft was sunk to a depth of thirty-four feet upon the vein, which continued uniformly four feet ten inches thick, the asphaltum being filled in pure and clear, without the least admixture of earthy or foreign ingredients, between the smooth and almost perfectly vertical walls of yellowish-greenish sandstone, lying in horizontal layers, through which this gash or fault was once no doubt an open fissure, communicating with some reservoir of coal oil which still, it may be, lies beneath it undisturbed. The most interesting part of the phenomenon for structural geologists is this gash.

The substance which fills this gash-fault in the coal measures of Northwestern Virginia resembles the glossiest, fattest caking coals, and has a decidedly prismatic structure; breaks up into pencils, with flat, lustrous faces and sharp edges, but the faces are not set at any fixed angles to each other, so that the effect upon the eye is rather that of a fibrous than of a prismatic structure. At the same time there is not the slightest appearance of layers, but the aspect of complete uniformity or homogeneity. Pieces are taken out, it seems, a foot in diameter; and that portion of one of these pieces which I have shows a plain face on one side, as if it had encountered one of the walls, and is covered with a delicate film of a dead black substance like charcoal dust, which is probably the dust of the vain substance itself.

Pieces lying at the surface of the ground are said to yield as much oil as specimens taken out six or eight feet down. By the ordinary dry distillation the substance is reported to yield as much oil as the Albert coal. By a different process, the first and only trial,

at which six hundred pounds in one charge were used, forty-four and a half gallons of superior oil were obtained. Retorts are now upon the ground.

Geographical and Mineralogical Report of Prof. W. F. Roberts.

McFarland's Run is a noted locality in the great oil formation of West Virginia. A vertical crevice filled with crystallized or solidified petroleum in a direct line is found crossing the deep-cut gorges of small streams and rising to the summits of the ridges bounding them.

In the month of June last I made a special visit to this part of the country for the express purpose of making a full and particular examination of this phenomenon, if I may so term it, in geology. I traveled from Cairo Station, on the Parkersburg branch of the Baltimore & Ohio Railroad, over a road then in progress of grading by the Ritchie Coal Oil Company for a branch railroad to connect their property containing this solidified petroleum deposit with the main road, and during this journey, I could not detect anything remarkable or different in the general geological structure of the country to that shown in some of the other oil-producing sections in the West Virginia "oil belts," with the exception of an opening made on the line of the road on the Ritchie Coal Oil Company's lands near McFarland's Run, where there is a vein of a peculiar substance, resembling somewhat some of the most glossy kinds of bituminous coal. Having secured specimens, I continued round the point of the hill, and entered a deep-cut gorge formed by a small run, a branch of McFarland's, and at about half the distance from the head of the run I reached a shaft sunk upon the line of a fissure, or crevice in the strata, in this peculiar kind of substance, of the same quality and characteristics of the specimen taken from the place above referred to. This crevice is a vertical one, four feet four inches wide, and the strata adjoining it on both sides is horizontal, a common micaceous sandstone, in their plys of a yellowish-green color, of the carboniferous formation.

The shaft, I was informed, was sunk thirty-four feet downward. It was perfectly filled with solidified petroleum. The course of the dyke or opening in the horizontal coal strata run in a course S. 75½ W. and to N. 75½ E., which I traced in both directions. I traced the opening which had been made in the line of this crevice up the steep-sided ridges and over their summits, and I found from the specimens visible at the several shafts that the solidified or crystallized petroleum rose to the surface, or nearly so, in all places. The west hill bounding the ravine where the dyke crossed over, I judged to be about three hundred feet above the level of the ravine where the deep pit was sunk. The east hillside is about two hundred feet above the ravine. Developments of shafting have been made proving the continuation of this Petroleum-filled crevice in solidified form more than one mile in a direct line, and bounded by a flat or horizontal formation of shales and sandstones of the middle carboniferous series, similar in all respects to other ridges in oil-producing sections in West Virginia. The walls of the crevice are perfectly smooth and regular, and exceedingly well defined.

The crystallized petroleum has a fibrous structure. It is very glossy in appearance, of the color of the purest specimens of richest and fattest bituminous gas coal. It melts under heat readily and runs like pitch. This peculiar mineral has been wrongly called "asphaltum." Its fracture, luctre and general appearance are altogether foreign to the Albert coal, or to any other mineral of that class. By experiments made upon this crystallized petroleum, it has yielded from one hundred and forty to one hundred and sixty-nine gallons of oil to the ton.

Developments will prove the continuation of the crevice filled with the same material—the crystallized petroleum—into and through the properties I am reporting upon, and in consequence of its embracing within their boundary lines two deep-cut valleys and high ridges intervening, an immense quantity can be mined above water level, and one cannot put an estimate too high upon this property, containing as it does, this valuable mineral substance.

How deep this solidified material may continue down beneath the level of the valleys is not determined. The crevice may get much wider, and still be filled with this solid Petroleum. One thing is, however, certain, that it has its source from some immense subterranean lake or large opening in the strata of the lower measures of liquid Petroleum. The numerous gas and oil springs closely contiguous and ranging with this dyke show that there are beneath the surface large cavities filled with oil.

At the junction of the streams which meet in the southern part of this tract is excellent boring territory, room enough for a large number of oil wells. The geological structure of the strata shows great disturbance underneath the surface, and here may be seen the pure oil oozing out from the joints of the rocks, and gas springs bubbling up on the surface of the water, throwing off oil in rainbow-colored tints. The nature of the formation, the geological structure of the strata and the contour of the surface, as well as other indications, show that this tract of land is located in an exceedingly rich Petroleum section of the country, where proper development should be prosecuted without delay. One thing more may with propriety be mentioned, that this solidified Petroleum in all places is free from any deleterious foreign substance. Where it has been shafted upon it is as pure as oil generally is found in the best oil-producing localities of West Virginia.

A few years ago thirty-two barrels of this mineral were sent North, and all of it was retorted, a large portion being put through on a commercial scale in the city of Brooklyn, and resulted as follows:

YIELD OF ONE TON.

Illuminating gas, 7,000 feet	@	$2.00	$14.00
140 gallons oil	@	.60	84.00
17 bushels coke	@	.12	2.0
			100.04

The analysis of Prof. R. Ogden Doremus gives the following result:

100 PARTS MINERAL DRIED AT 212° FAH.

Ash	2.15
Hydrogen	8.45
Carbon	75.96
Oxygen	12.75
Nitrogen	.69

RESOURCES OF WEST VIRGINIA.

PETROLEUM.

BY HON. WILLIAM E. STEPHENSON, OF PARKERSBURG, WEST VIRGINIA, 1876.

PREPARED UNDER THE DIRECTION OF THE STATE BOARD OF CENTENNIAL MANAGERS OF THE STATE OF WEST VIRGINIA, 1876.

Prof. M. F. Maury:—

DEAR SIR:—In accordance with your request, I give you some account of the oil interests of West Virginia, and am sorry that sickness and a press of business prevented my writing a fuller statement of this very important item in our natural resources. A source of considerable wealth to the State since 1864 is found in the production of Petroleum. This production at present is confined principally to what is known as the "Oil Break," a geological upheavel of the earth's surface, giving it a roof shape or bulge, especially in the rocky portion. This break, passing from Ohio into this State, crosses the Horse Neck Fork of Bull Creek, Cow Creek and French Creek, all of which flow into the Ohio River a few miles above Marietta; then passes in a direction to the southeast, across Goose Creek, Hughes River and the valley of the Little Kanawha, in the direction of Charleston.

Petroleum in small quantities was found within, and even outside the territory of this break, at a very early day. As far back as 1771, Thomas Jefferson gave an interesting description of a burning spring, and the oil connected with it, found in the Great Kanawha valley. But it was not until modern discovery and invention had transmuted the oily treasures into a source of money-making that its abundance and multifarious uses became rapidly known. The main developments of the oil interests of West Virginia commenced soon after the close of the war of 1865. There had been partial developments in different sections of the State prior to that period, but it was in a very primitive way. At Burning Springs, in Wirt county, and at different points along "The Break," wells had been drilled and oil obtained in paying quantities, but the difficulties found in getting it to market deterred operators from making "developments" in any satisfactory manner.

Petroleum has been obtained near Morgantown, in Monongalia county, and at points on a line from Morgantown to Charleston, Kanawha county. This fact gives rise to the theory that the "great Pennsylvania oil belt" extends into West Virginia, and crosses the State from north to south. Acting upon this theory, parties are now actively "prospecting" for new oil territory. A beginning will be made during this summer, on territory at the headwaters of the Little Kanawha River. It is thought by practical oil men that this line is to be the future oil field of the State. Everything in this direction, however, is in the future. A few months will, it is believed, confirm or disappoint the now pronounced belief of some of the most successful operators of Pennsylvania, in the success of the attempt. Many of them propose to make large investments in this direction. But, looking to the past, we must consider what has already been done in the way of actual accomplished facts: Up to 1865, the oil business in West Virginia had been almost entirely speculative. Large amounts of money had been expended, and but little return had been made on the investments. In 1865-6, however, the business assumed a legitimate form. Oil men came to an appreciation of the fact that this, like any other legitimate calling, had to be followed with an eye to economy, and to a proper regard for order and system in the management of oil and oil wells. As a consequence of this oil development assumed a more scientific and businesslike shape. Operations commenced almost simultaneously at Burning Springs, Oil Rock, California House, Volcano, Sand Hill and Horseneck. Large quantities were produced at all of these points. Light oil was obtained from each of these places except at Volcano and Sand Hill. At these points were produced the "heavy oils," which have obtained a world-wide reputation as "lubricators."

The amount of heavy oil produced in the West Virginia oil regions is about three hundred barrels per day. Its gravity runs from 26° to 32° Beaume. It is used, in its crude state, almost exclusively for the purpose of lubrication. It will stand a lower degree of cold test than any other oil lubricator. This, added to its extreme cheapness, gives it the preference to all other lubricators, for general purposes. By different processes of reducing and admixture with oils of a lighter gravity, it makes most excellent lubricators, at still lower rates than the crude article is produced. These, as well as the crude heavy oil, are used in all parts of the country, and even form a large item in our export trade. The wells producing heavy oil are durable in their character, yielding not a large but steady flow of their oily treasure. It is the opinion of most experienced operators that there is still undeveloped heavy oil territory of large extent within the State. Whilst the light oil regions ran a rapid course, giving a large yield during their productive career, the heavy oil district continues to remunerate the producer. Some idea may be gained of the extent of the oil development in the districts just named by the inspection of a few figures. As far as can be estimated, there have been produced not less than 3,000,000 barrels of oil. The specific gravities of these range from

27° to 45° Beaume, the greater portion varying from 27° to 33°.

The estimated value of this product is about $20,000,000. The number of producing wells at present is 292, averaging about three barrels per day each. If the price and the times justify it, this number would probably be doubled in twelve months. One noticeable feature in the development of oil in West Virginia is the cheapness of putting down wells. In Pennsylvania it costs from $5,000 to $10,000 to drill a well, while in the oil district of West Virginia it costs not exceeding $1,200. Men of small means can operate in the State, but in Pennsylvania the operator must have a fortune to make success certain.

Notwithstanding the fact that oil had been developed in Pennsylvania long prior to 1865, and that large sums had been expended in the production of the crude product, in Venango county, in that State, to West Virginia belongs the honor of first furnishing the means of transporting it to market in the modes now recognized to be cheap, safe and expeditious. By means of tubing lines and iron tank cars oil is shipped to the seaboard and to all parts of the country in bulk, thus cheapening transportation, and bringing the article to the door of the consumer.

By means of steam pumps, adapted to the purpose, oil is propelled for miles through iron tubing to such terminals as are accessible. It is cheaply pumped to the Ohio River, or to the Baltimore & Ohio Railroad and to the Laurel Fork & Sand Hill Railroad, and from thence transported in tank cars to its destination, the product being handled with safety and great expedition. By these means the producer is enabled to send his oil to market from the most inaccessible points. Parkersburg is the great oil center of the State. Here is the market for the crude article, both for West Virginia and Ohio. Here are large refineries, which not only consume our own production, but import largely from Pennsylvania. The refinery capacity of Parkersburg is about 2,000 barrels per day. In connection with most of the refineries are "reducing" and "treating" houses, for putting the heavy crude oil into shape for lubrication. Being at the junction of the Little Kanawha and the Ohio Rivers, and the center of railroad connections which gave it the advantage of river and rail transportation, it has become a recognized point in the sale and delivery of crude oil and its products. The trade gives employment to several hundred operatives, besides furnishing facilities by which great prosperity has been brought to this active and well-to-do city.

A few words about the uses of Petroleum may be of interest to the general reader. The "heavy oils" are extensively employed for lubricating purposes, taking the place almost wholly of the various articles heretofore in use for this purpose. For illuminating purposes, the light oils, when refined, are extensively—almost universally—used. This is not to be wondered at, when it is known that the intensity of the light of the refined Petroleum is eighteen times as great as that of burning fluid; six times as great as that of sperm oil, and more than twice that of camphene, while the oil itself is furnished more cheaply than any of the above-named articles. Printing inks of all colors are made from Petroleum, the black especially being an excellent article. Many varieties of soap are made from it and are held in high repute. The medical qualities of Petroleum, especially the crude article, have long been known; its use as a liniment, more especially for cutaneous diseases, is quite extensive. As a specific for consumption, by the inhalation of its vapors, it has acknowledged virtues. Recently, it has been applied with very satisfactory results as a motive power in running the machinery of steamboats, iron mills, etc. It is also used successfully in smelting iron ores, and as a coating for iron and wood to preserve them from decay; indeed, for almost numberless other purposes which cannot be even named in a brief article like this.

Yours very truly,

WILLIAM E. STEPHENSON.

Parkersburg, W. Va., April, 1876.

KENTUCKY AND TENNESSEE OIL FIELDS IN 1873.

Along Boyd's Creek, Barren county, Ky., three miles from Glasgow, are the best oil wells of this State. Glasgow is a town of three thousand inhabitants, situated on a branch of the Louisville and Nashville Railroad, and one hundred miles from Louisville, and eighty from Nashville, Tennessee. At the present time there are fifteen wells in operation, producing oil. The Armell wells in this district are drilled to a depth of 130 feet, three of which are flowing about three barrels per day. Two of these wells have flowed for six years, and at one time produced 400 barrels per day. Chess, Corley & Co., oil refiners at Louisville, who own a large scope of territory in this section, have met with good success as oil operators, having thus realized a large fortune.

Their well No. 1 is producing 35 barrels per day. At first it produced 70, and has now been pumping three years. A Pittsburgh Company own some land here, on which they have put down a number of wells, producing on the average 3½ barrels per day.

The pioneer oil men of this region are Messrs. Chess, Corley & Co. and Messrs. Graham & Thomas. Both these firms commenced operations early in 1865.

During 1865 and 1866 considerable interest was manifest on Boyd's Creek, and many wells were put down, all of which pumped or flowed more or less oil. With the increased production, the price fell from $1.50 to 25 cents per barrel, at the wells. The oil was 40° gravity and tainted with sulphur. With the limited knowledge of refining at the time it was difficult to deoderize it. Operators became discouraged, and the territory fell at once. Some wells, within a few days of completion, were abandoned, and the oil adventurers went back to their various homes, many discouraged, others hopeful that when oil would become scarce, and science

overcome the deoderizing difficulty, all would again be prosperous. In 1869 active operations again commenced, and with the improvements in the refining process, the prices rose from 25 cents to $2.00 per barrel.

There was quite an excitement in 1867 near Burksville, Cumberland county, Kentucky, which was occassioned by the striking of the Crocus well at a depth of 300 feet, which flowed 300 barrels of heavy oil per day, after discharging salt water for three months, but this promising field was abandoned by reason of the extreme cost and difficulty of shipment and consequent low price of oil. There is one well in this section, which is only 80 feet in depth, and has flowed six-dollar lubricating oil for the past six years. The oil from this well is teamed 40 miles to the river, and shipped down the Cumberland to Nashville, Tennessee. Navigation on the River is only open five months in the year. In Cumberland county, on one of the tributaries of the Cumberland River, a well exists which was put down to a depth of 400 feet, and has flowed about 60 barrels per day into the stream, for upwards of four years. The oil from this well is quite black, very heavy, and of a rank smell. Along Scrub, Indian and Greasy Creeks, on the Cumberland River, there are many oil springs, which produce from one to five barrels per day of surface oil. These wells or pits are dug down to the blue clay to the bed rock. Cumberland county is the foot of the mountain range, and is hilly and rocky. Burksville, the county seat, is connected with a railroad and by a forty-mile stage route.

Near Bowling Green, Ky., a well was sunk to the depth of 80 feet, which produced oil in considerable quantities, for over twelve months. The owner built a small refinery for the manufacture of his own production. This was the only well drilled in that section. Within a few miles of the Mammoth Cave, near Green River, there are several oil springs. The surface rock here is so impregnated with oil and gas, that a match will ignite them. At Boston station there is a gas well, some 90 feet in depth, which produces a considerable quantity of gas.

There is little doubt but the north-western part of Kentucky is rich in coal and oil. We know that one well was drilled in Henderson county, near the Ohio River, which passed through a four-foot vein of coal, at twelve feet from the surface; and another six foot vein, at 50 feet from the surface, and at 450 feet a small well of the best lubricating oil ever produced was discovered.

It is the opinion of practical oil men who have visited Kentucky, that the best oil lands have not yet been touched, and that all that is required to make this rich mineral State prosperous, is capital and energy.

Little is known of the producing capabilities of Tennessee, but it bears the evidence of being an important field of enterprise for the production of oil. At White Bluff, Dixon county, thirty miles west of Nashville, there is a small green oil well of the same character and quality as that of Butler county, Pennsylvania. This well is 500 feet in depth.

Mr. Eugene Scott, of Karns City, Butler county, Penna., informs us that he visited the wells on Boyd's creek, late in the fall of 1872. He says: "I was astonished to learn that in this enlightened age of petroleum mining, the people here knew little about the business. The derricks were only 30 to 45 feet in height; some with one bull wheel, and some with two. The whole rig is of white wood. .. * * * * * * They dressed their bits in the shape of a wedge, and reamers, why, they are beyond description. Drilling is only done in the day time, and it is usual to take six weeks to get down 150 feet. The seed-bag is put on the tubing, which is frequently drawn in testing. The oil-bearing rock is a kind of a shell and sand-rock mixed, and of a white color .The stream (Boyd's Creek) had been tested three miles north and south, and finding the best wells in the center of the line of tests, and that the hills had not been operated on, I concluded that the belt crossed the creek, and ran parallel with the Pennsylvania belt, therefore I took a large lease southwest of the best producing well on the Creek, and at the depth of 250 feet struck 28 feet of loose sand, full of oil and salt water. Two miles northesast of this, and on a line with the best wells on the Creek, my partner drilled a well with a Pennsylvania oil rig, and in six days reached the sand-rock, but there was little oil; the well produced only one barrel per day."

"It is usual when a well is dug in this country, to pump it for a few days, and then tube with three-quarter inch pipe, and let it flow—then remove the machinery, and drill another well. The bed rock of the Barren county oil field is white limestone, which in the valley is about eight feet from the surface. The surface rocks are usually flat, and so porous that water will run through them readily.

We are furnished by this gentleman above named with the following well records:

30 feet, white limestone;
40 " shale;
60 " limestone;
20 " oil bearing rock, a kind of shell and sand-rock, mixed, and of a white color.

OIL REGION OF INDIANA IN 1873.

In the western part of Crawford county, Ind., there is an oil region that has never been properly tested by that only sure test—"the drill." The surface indications of oil extend five miles in width by over ten miles in length, and consist of a tar spring, oil springs, and oil rock, of several varieties and in great abundance. The tar spring has been known ever since the county was settled, and is nine miles from Leavenworth; it is about half way up a large hill which is probably one hundred and fifty feet high; it flows after each heavy rain, and in the course of a year throws out tons of tar or asphaltum. It is between the Otter

fork and the West fork of Little Blue; the nearest well to it is the Dexter well, which is two miles distant. The oil springs are found on Otter fork, and West fork, and in hollows tributary to them, there are quite a number of them from which small quantities of oil can be collected. The oil rock is found in great abundance. At one place on Otter fork, the bed rock of the creek is a soft, black sandstone, and contains over thirty per cent. of oil. If a piece of it is put into a fire it blazes like a candle, and will continue to burn till it loses one-third of its weight. In the vicinity of the Dexter well on the West fork, the oil rock is in great abundance, and in almost every hallow—and their name is legion—in all that locality, rock more or less impregnated with oil may be found.

The Wells.—In 1861 a well was sunk to the depth of ninety-seven feet, by a man named Custerman. He obtained no show of oil, and never pumped the well. The war caused him to stop work, and he has never been heard of in that locality since. In 1863—4 several wells were sunk —three on the west fork. The Dexter well is 580 feet deep, and has a fine show of oil; it rises constantly in the conductor; a quart can be taken off every morning. It is lubricating oil of good quality. It now belongs to the Dexter Oil and Salt Company, and they intend to sink it deeper this year. The Clark well, located three miles below, is 640 feet deep; found no oil; a little gas and saltish water. The well has been left open and is filled with sediment. The Eaton Sulphur Well three miles further down the creek, is only 275 feet deep; flows white sulphur water. It is becoming a great resort for invalids.

These are all the wells that have ever been sunk on the West fork. On the Otter fork, there have been five wells sunk. A small show of oil was found in two of them. The Golden Salt well is one of them, and is over 1,000 feet deep. All of these wells are below the indications. No well has ever been sunk on either creek above the indications except the one mentioned.

The Geological Position.—The locality is in the sandstone which underlies the Great Indiana coal field; the first strata below is the carboniferous limestone, which is about 800 feet thick; the next strata is known as the knob sandstone, and is about 400 feet thick, and is the last strata through which they passed at Terre Haute, in sinking their well, which is the only successful oil well yet sunk in the State. It is 1,625 feet deep.

"The Crawford County Petroleum and Mining Company" are now sinking a well at Leavenworth. It is to be sunk through the black slate penetrated at Terre Haute, which will be a depth of about 1,300 feet.

The marked difference in the geological formation in the Indiana region and those of Pennsylvania and West Virginia is in the limestone, and consequently wells will have to be deeper here to reach the main source of the oil, which lies below it. While the thick strata of limestone will make it expensive to sink wells, it is a good evidence that the oil exists in abundant quantities, or it would not rise so far through it and make so great and extensive surface show.

The Louisville, New Albany and St. Louis Railway passes through the center of Crawford county.

CALIFORNIA OIL FIELDS IN 1860

The discovery of petroleum in California adds another to the already widely varied products of that State. It has been known for a long time that deposits of petroleum existed near the coast, but as yet the production of this oil has been unimportant. The Leaming Petroleum Company, recently organized in San Francisco, has fairly abundant success. The crude oil is found in the mountains of the San Fernando District, thirty-five miles north-west of Los Angeles, from which point there is railroad communication of thirty-one miles with the Port of San Pedro. The cost of transportation from the mines is 2½ cents the gallon, and the cost of refining 2 cents per gallon for small quantities, and 1½ cents for large lots. Up to the present time several shipments of crude oil have been received at San Francisco, aggregating some hundreds of barrels, which have found immediate purchasers at remunerative rates. The Gas Companies are prepared to take and use not less than 1,000 barrels per day, and the district owned by the company is sufficiently extensive and prolific to warrant the delivery of that or even a greater amount, so soon as the requisites can be obtained to furnish suitable works. These shipments have, so far, been the products of natural springs from which the oil was dipped with buckets; one spring is now producing two barrels per day; but when a system of scientific operations shall have been introduced, the yield will be greatly augmented. It is the opinion of capable men who have carefully examined the mines, that they are of sufficient capacity to furnish nearly all of the oil required for consumption on the Pacific coast.

GEOLOGICAL HISTORY OF THE OIL FIELDS OF AMERICA.

The geology of the oil country is a subject upon which many theories have been wrecked. In dealing with it I propose to present a few quotations from the best authorities I can find upon the subject, and I would here acknowledge my indebtedness to that excellent little work of Henry E. Wrigley, Esq., C. E.

It is well known that the Allegany mountains divide the United States geologically as well as geographically; that east of them lie the transition, the primitive and the alluvial formations, and west of them the great secondary formation, or formation by deposition from water. This secondary formation extends across the continent, from the Alleganies to points far west of the Mississippi.

Whether the great valley drained by the Mississippi was once swept over by an ocean, of which the Great

Lakes are but the remaining puddles, is not an object of immediate interest. That the Alleganies formed the shore or beach of some such body of water, and that along its edge were strewed animal and vegetable remains, it is undoubtedly safe to assume.

The presence of carbon, as the base of oil, shows that these deposits were either animal or vegetable, it being the base of the animal and vegetable world, as silica is likewise of the mineral world.

Of course, the drill does not reach these deposits. They lie perhaps almost uniformly under the edge of this formation, at a depth of from 30 to 40,000 feet. The heat at this depth, although only a matter of estimate, is doubtless very great, as we know that between 150 and 2,000 feet in depth there is an increase of 30°. It would seem, then, that these deposits of animal or vegetable matter are volatilized and thrown off into the upper rocks, and condensed there, by the lower temperature, into liquid oil. Into what rock the gas will enter will depend upon the character of the rock. A close slate or sandstone will resist it; but wherever it finds a crevice or an open porous rock, it will force its way into it, and will condense there.

Consequently the rock itself is the guide of the driller in searching for oil, and the location of the oil-producing spots resolves itself into the existence of this porous sand rock.

All the oil-producing spots that have been found in this section of the United States are included in a belt of fifty miles in width, stretching from Western New York to Tennessee, in a line parallel with the Alleganies, and lying about fifty miles to the west of them. The producing spots themselves are in area but the smallest specks upon this belt, and are scattered over it in such an indiscriminate manner that it is impossible to trace any connection between them, or, rather, to deduce the position of one producing spot from others, with any degree of satisfaction. It is equally impossible to trace any connection between these spots and the water-shed or river-drainage of the country.

A matter which will somewhat affect the question of production at the south end of the belt is the dip of the sand rock deeper into the earth as it goes south. Although this is, in a great measure, counteracted by the general slope of the water-shed of the country in that direction, it will still average, as near as can be ascertained by leveling and drilling, about thirty inches to the mile. Professor Silliman says that "Petroleum is uniformly regarded as a product of vegetable decomposition."

Professor Dana says: "Petroleum is a bituminous liquid resulting from the decomposition of marine or land plants (mainly the latter), and perhaps also of some non-nitrogenous animal tissues."

Professor Denton says: "It is a coral oil, not formed from the bodies of the coral polyps, as some have supposed, but secreted by them from the impure waters, principally, though not exclusively, of the Devonian times."

Professor Winchell says: "Crude Petroleum is not a product of definite composition. It seems to be a varying mixture of several hydro-carbons, some of which, as naphtha, volatilize with rapidity when exposed to the atmosphere; others, as kerosene, slowly; while others, as bitumen, are nearly fixed. It contains also varying quantities of aluminous matter and other impurities.

Petroleum occurs in stratified rocks of all ages, from the Laurentian to the recent. It has even been observed in some rocks of a granitic structure. The mere presence of Petroleum in a formation is far from being evidence that it exists in large quantities. Observation has shown that it does not exist in large quantities in any formation except under certain intelligible conditions. Its presence in small quantities is to be expected.

It is an opinion almost universal among geologists that Petroleum has been produced from organic remains. Hence, long before the discovery of eozoon in Laurentian rocks, it had been inferred that organic life existed upon our planet during the accumulation of these rocks, because, among other reasons, they afford conspicuous quantities of Petroleum. Geologists are somewhat divided in opinion as to whether animal or vegetable organisms have afforded most of the native oil. Little dissent exists, however, from the doctrine that most of the oil occupying the pores and pockets of fossiliferous limestone has been derived from animal bodies, while that saturating shales, and arising from shales, has had a vegetable origin. As the oil of commerce is probably derived from the latter course, it appears that we are to regard our commercial oil as a marine, animal, mineral and vegetable product."

Professor Winchell closes his article on the geological phenomena of Petroleum by presenting a synopsis of oil regions, and the formation tributary to their supplies.

I. The black shales of the Cincinnati group afford oil which accumulates in the fissured shaly limestones of the same group, and supplies the Burkesville region of Southern Kentucky, and Manitoulin Island, in Lake Huron.

II. The Marcellus shale affords most of the Petroleum which accumulates in the fissured shaly limestones of the Hamilton group, and thus supplies the Ontario oil region, locally divided into the Bothwell district, the Oil Springs district and the Petrola district. The Marcellus shale affords also a large portion of the oil which accumulates in the drift gravel of the Ontario region.

III. The Genesee shale, with perhaps some contributions from the Marcellus shale, affords oil which accumulates in cavities and fissures within itself in some of the Glasgow region of Southern Kentucky. It affords also the oil which accumulates in the sandstones of the Portage and Chemung group, in Northwestern Pennsylvania and contiguous parts of Ohio. It affords also the oil which accumulates in the sandstones of the Waverly (Marshall) group, in Central Ohio. It affords also that which accumulates in the mountain limestone of the Glasgow region of Kentucky and contiguous parts of Tennessee, as also some of that which is found in the drift gravel of the Ontario region.

IV. The shaly coals of the false coal measures, aided, perhaps, by the Genesee and Marcellus shales,

seem to afford the oil which assembles in the coal conglomerate, as worked in Southwestern Pennsylvania, West Virginia, Southern Ohio, and the contiguous but comparatively barren regions of Paint Creek, in Kentucky.

V. The coal measures may perhaps be regarded as affording a questionable amount of oil, which may have been found within the limits of the coal measures in the West Virginia and neighboring regions.

From this exhibit, it appears that the principal supplies of Petroleum, east of the Rocky Mountains, have been generated in four different formations, accumulated in nine different formations, and worked in nine different districts. The sandstone beds in which the Pennsylvania oil is found belong to the Chemung group of the Devonian formation. It is so called from the Chemung River, in the State of New York, where it is well exhibited.

HISTORICAL GEOLOGY.

The history of geology has been divided into four eras. The first era is known as the Archæan era. The word Archæan is the Greek for beginning. The second era, the Paleazoic era. Paleazoic means ancient life and is used here because it includes the earliest forms of life. The third era is the Mesazoic. Mesazoic means middle life. The fourth, the Cenazoic era, the period of recent life.

Archæan time is the period when the oldest known rocks were formed by the action of the water and heat on the cooling crust of the earth. In the early part of the next era (the Paleazoic) appear traces in the rocks of the first forms of life. This is called the Silurian age; and the rocks of this period were all made under water from sediment and the remains of animals and vegetables deposited during very long periods of time. The rocks of this era are mostly sandstone, limestone and shales. The next or upper part of this era is known as the Devonian or age of fishes. From the rocks made in this age, we find that the sea was peopled with fishes. Some of them of immense size. The land had swarms of insects and was covered with dense jungles and heavy forests.

The third division of this era is known as the Carboniferous age, or age of coal plants. The word Carboniferous is from the Latin word carbon. The fourth division, known as the Cenazoic era, the period of recent life, was followed by what is called the Glacial period, when the whole eastern part of the continent, reaching southward to the fortieth parallel, was covered with immense fields of ice, resulting in the peculiar formation called drift. This was in turn followed by a period of warmth, melting and flood, called the Champlain period; and again tropical vegetation took place and the animals began to roam in the forests and the fishes inhabited the waters as at the present day.

The geological history of the earth, its age and the number of years the several groups of oil and natural gas producing strata were in the process of formation. The first Petroleum age of the earth is known as the Laurentian period and it embraces the Cambrian and Trenton rock of the lower Silurian age. The two ages of the Laurentian period have covered an era of one hundred million years.

The Lima, Ohio, and Indiana oil is produced from the Trenton Rock limestone of the lower Silurian age of the Laurentian period, which covered an era of one hundred million of years in forming. After that period came the Devonian, embracing the Carbon and Permian ages. In this period all the groups of oil and natural gas producing strata in Pennsylvania, New York, West Virginia, Southeastern Ohio, Kansas, Indian Territory, Tennessee and Kentucky were formed. This period covered an era of forty-six million four hundred thousand years. Following this come the Triassic, the Jurassic and Chalk periods, covering an era of fourteen million three hundred thousand years. The Texas and Louisiana oil strata were formed in the Cretaceous age of the Chalk period. Following this period is the Eocene, Miocene, Neocene and Pliocene periods. The oil strata of Colorado, Utah and Wyoming are of the Cenazoic age of the Eocene period; and the oil strata of California is of the San Pablo age of the middle Neocene period. The periods covered an era of two million eight hundred thousand years. This brings us up to the Glacial age, which was five hundred thousand years ago.

GEOLOGY OF ROCKS.

Rocks are found in layers or beds one above another and are called stratified rocks from the Latin word stratum, meaning bed. These layers were made one after another, beginning with the lowest, which is therefore the oldest and is embedded with seaweed, which is the first appearance of vegetable life; and in the succeeding layer is found the first appearance of animal life. Rocks have been divided into three classes, namely, igneous, sedimentary and organic. Igneous rocks are those which have been melted in the earth or have resulted from some volcanic action. Sedimentary rocks are those made from sediment deposited from the waters of oceans, lakes or rivers. Rock thus made from sand is called sandstone; that from mud is called shale, and that from gravel, conglomerate or pudding stone. Organic rocks are those which have been formed entirely from animal, marine and vegetable life, the true sources of petroleum oil and gas.

THE ORIGIN OF PETROLEUM AND THE POWER THAT CAUSES OIL AND WATER WELLS TO FLOW.

Beginning with the Laurentian period, the oldest and deepest strata that the world has any record of as a Petroleum crude oil producer were in the process of formation one hundred and sixty-four millions of years ago. The Laurentian period is underlaid by the Paleazoic period, which had the first rocks and shale that had traces of life. After this period a

OUTLINE TABLE SHOWING THE OIL AND NATURAL GAS PRODUCING SANDS IN NORTH AMERICA.

NERALIZED VERTICAL SECTION SHOWING THE VARIOUS STRATAS AND NAMES USED IN THE DECENDING ORDER N NORTH AMERICA THAT ARE KNOWN TO CONTAIN PETROLEUM—OIL AND NATURAL GAS BEGINING AT THE TOP THE SOIL AT THE SOUTH PENN OIL COMPANIES WELL №17, GENINE ROBINSON FARM AT FOLSOM-ROBINSON, WETZEL CO. ST VIRGINIA, WHICH IS THE HIGHEST POINT OF ANY WELL DRILLED THROUGH ALL OF THE UPPER AND MIDDLE OIL AND URAL GAS PRODUCING SANDS IN THE APPALACHIAN RANGE AND EXTENDING DOWN TO THE QUEBEC GROUPE OF THE CAMBRIAN PERIOD. HE PITTSBURG VEIN OF COAL WHICH IS EXPOSED TO THE SURFACE AT MT WASHINGTON PITTSBURG, PA. IS THE RULE USED FOR ALL WELLS THAT FIND PITTSBURG COAL AS THE LEVEL THAT ALL SANDS ARE MEASURED FROM AND THE RULE USED IN THIS TABLE. THE DISTANCE FROM THE SURFACE AND PITTSBURG COAL TO THE CAMBRIAN PERIOD IS GIVEN APPROXIMATELY

OIL AND NATURAL GAS HORIZONS

OGICAL EQUIVALENT	NON-PRODUCTIVE STRATA	PRODUCTIVE	PRODUCTIVE LOCALITY	APPROXIMATE DEPTH BELOW SURFACE. FEET	APPROXIMATE DEPTH BELOW PITTSBURG COAL. FEET
	SURFACE				
	SLATE				
	RED ROCK			150	
KARD OR PERMIAN	LIMESTONE				
ERIES NO. XVI.	SLATE	SAND		300	
	SLATE	SAND			
	SLATE			900	
	LIMESTONE				
	SLATE	COAL			
	RED ROCK	SAND		1200	
	SLATE	MAPLETOWN COAL			
ONONGAHELA	LIMESTONE		SOUTHWESTERN PENNSYLVANIA		
ERIES NO. XV.	SLATE		AND WEST VIRGINIA.	1330	
	RED ROCK				
	LIMESTONE	SAND		1400	
	SLATE			1428	
	LIMESTONE	PITTSBURG COAL	PENNSYLVANIA AND WEST VIRGINIA.	7	
	SLATE	CONNELLSVILLE OR FIRST COW RUN SAND			
MAUGH OR BARRON	SLATE	MORGANTOWN OR LITTLE DUNKARD SAND		1500	65
MEASURES	SLATE	MASONTOWN COAL			
ERIES NO. XIV.	BLACK CAVE		SOUTHWESTERN PENNSYLVANIA		
	LIMESTONE		AND WEST VIRGINIA.		
	BIG RED ROCK CAVE				
	LIMESTONE			1800	365
	LITTLE RED ROCK CAVE			1900	465
	SLATE	MAHONING, HURRY UP OR DUNKARD SAND			
	LIMESTONE	UPPER FREEPORT COAL			
HENY RIVER COAL	SLATE		SOUTHWEST PENNSYLVANIA		
OWER PRODUCTIVE	SLATE	FREEPORT OR GAS SAND	WEST VIRGINIA		
SERIES NO. XIII.	SLATE	SECOND COW RUN SAND	AND SOUTHEAST OHIO.		
	SLATE	LOWER FREEPORT COAL			
	FIRE CLAY AND SLATE	UPPER, MIDDLE AND LOWER KITTANNING COAL BEDS		2300	865
	FERRIFEROUS LIMESTONE			2360	925
		TIONESTA, HOME WOOD OR JOHNSON RUN GAS SAND			
BURG CONGLOMERATE	SLATE	NEW RIVER COAL	PENNSYLVANIA, WEST VIRGINIA,		
SERIES NO. XII.	SLATE	POCAHONTAS COAL	SOUTHEAST OHIO, KENTUCKY,		
	SLATE	UPPER CONOQUENESSING OR UPPER SALT SAND	KANSAS, OKLAHOMA,		
	SLATE	LOWER CONOQUENESSING OR MIDDLE SALT SAND	AND INDIAN TERRITORY.		
		SHARON, CONGLOMERATE, OLEAN, LOWER SALT, BLUE MONDAY OR MAXON SAND		2550	1115
CH-CHUNK RED SHALES.	LITTLE LIME				
VER CARBONIFEROUS.	PENCIL CAVE				
SERIES NO. XI.	BIG LIME	KEENER SAND	WEST VIRGINIA AND SOUTHEAST OHIO.	2800	1365
POCONO	SLATE				
G INJUN OIL SAND		BIG INJUN OR SUB-OLEAN SAND	SOUTHWEST PENNSYLVANIA, WEST VIRGINIA,	2950	1515
SERIES NO. X.	SLATE		SOUTHEASTERN OHIO AND EASTERN KENTUCKY.		
	SLATE	SQUAW OR LEWIS SAND		3000	1565
	SLATE	BUTLER COUNTY GAS SAND	WESTERN PENNSYLVANIA.	3070	1635
	DEVONIAN OR OHIO SHALES	BEREA GRIT OIL SAND	WESTERN NEW YORK, NORTHWESTERN PENNSYLVANIA, NORTHEASTERN OHIO, WESTERN KENTUCKY AND SOUTHERN INDIANA	3400	1965
	SLATE {HUNDRED FOOT SAND}	FIRST OR GANTZ SAND	WESTERN PENNSYLVANIA, WEST VIRGINIA AND SOUTHEASTERN OHIO.		
CATSKILL OR	RED AND BLUE SLATE	FIFTY FOOT SAND	SOUTHWESTERN PENNSYLVANIA AND WEST VIRGINIA.		
PER DEVONIAN	SLATE	SECOND OR THIRTY FOOT SAND	WESTERN PENNSYLVANIA AND	3445	2010
SERIES NO. IX.	SLATE	GRAY GORDON, STRAY OR BOULDER SAND	WEST VIRGINIA.	3505	2070
	SLATE	THIRD OR GORDON SAND	WESTERN PENNSYLVANIA, WEST VIRGINIA AND SOUTHEASTERN OHIO.	3565	2130
	SLATE	STRAY THIRD SAND	WESTERN PENNSYLVANIA AND WEST VIRGINIA	3615	2170
	SLATE	FOURTH SAND	SOUTHWESTERN PENNSYLVANIA AND	3645	2200
	SLATE	FIFTH OR McDONALD SAND	WEST VIRGINIA.	3705	2260
	SLATE	BAYARD SAND	SOUTHWESTERN PENNSYLVANIA AND	3865	2420
	SLATE	ELIZABETH OR SIXTH SAND	NORTHERN WEST VIRGINIA.	4035	2590
	SLATE	WARREN FIRST SAND		4145	2700
	SLATE	WARREN SECOND SAND	NORTHWESTERN PENNSYLVANIA.	4260	2815
	SLATE	CLARENDON OR TIONA SAND		4395	2935
	SLATE	SPEECHLEY SAND		4560	3100
	SLATE	CHERRY GROVE OR BALLTOWN SAND		4760	3300
LWER DEVONIAN	SLATE	SHEFFIELD OR COOPER SAND	NORTHWESTERN PENNSYLVANIA	4875	3415
SERIES NO. VIII.	SLATE	BRADFORD OR DEERLICK SAND	AND	4940	3525
	SLATE	ELK, WAUGH OR PORTER SAND	WESTERN NEW YORK.	5165	3750
	BLACK SHALES	KANE SAND		5340	3925
	BOTTOM OF DEVONIAN		NORTHWESTERN KENTUCKY AND SOUTHERN INDIANA.	6590	5325
	HAMILTON LIMESTONE		SOUTHWESTERN ONTARIO, CANADA	6595	5330
	CORNIFEROUS LIMESTONE		NEW YORK AND SOUTHWESTERN ONTARIO, CANADA.	6890	5625
		ORISKANY SAND	CENTRAL NEW YORK, SOUTHERN ONTARIO AND SOUTHERN INDIANA.	6925	5660
	GULPH LIMESTONE		SOUTHERN ONTARIO AND WESTERN NEW YORK.	6965	5700
	NIAGARA LIMESTONE		SOUTHERN ONTARIO, WESTERN NEW YORK AND INDIANA	7085	5820
	SLATE		SOUTHEASTERN AND CENTRAL OHIO AND SOUTHEASTERN		
	CLINTON LIMESTONE		ONTARIO.	7250	5985
ILURIAN		MEDINA RED SAND	SOUTHEASTERN ONTARIO, WESTERN NEW YORK AND OHIO.	7350	6085
ERIES NO. VII.	SLATE	MEDINA UPPER WHITE SAND	SOUTHEASTERN ONTARIO AND WESTERN NEW YORK.	7450	6185
	SLATE	MEDINA WHITE SAND	CENTRAL NEW YORK.	7505	6240
	TRENTON LIMESTONE	TRENTON ROCK	OHIO, INDIANA AND KENTUCKY.	10445	8700
	UPPER TRENTON ROCK				
	SLATE		SOUTHEASTERN AND CENTRAL ONTARIO		
	TRENTON LIMESTONE		AND NORTHERN AND CENTRAL NEW YORK.	10970	9225
MBRO-SILURIAN	LOWER TRENTON ROCK				
SERIES NO. VI.	SLATE				
	CALCIFEROUS LIMESTONE		SOUTHEASTERN ONTARIO AND CENTRAL NEW YORK.	11720	10000
IAN.—SERIES NO. V	SLATE	QUEBEC SAND	ALABAMA, GEORGIA AND WESTERN NEW FOUNDLAND	12320	10300

climatic change on the face of the earth took place. This was the period that a vegetable grew which formed the beds of clay. At the close of this period another climatic change on the face of the earth took place, which is known as the Heat period, and during which period the clay beds were baked into shales—slate. This was the under clay of the first or lower Silurian period, when the earth was covered with water which contained marine life. The water in cooling off the earth or baked clay beds caused cracks or fissures in the shale or slate, which allowed the water to fill the porous parts of the earth. While the water was receding vegetable and animal life took place. At the end of this period another climatic change occurred, which completely changed the character of the earth's surface. As a legacy to the world death left Petroleum. Animal, vegetable and marine life were ruthlessly destroyed in this period.

Countless millions of fishes were carried on the crest of the flood. Then the waters subsided and the fish were left floundering in the mud; they could not release themselves; they sank deeper and deeper in the thick deposit, which closed over them and hardened rapidly. The fate of animal and vegetable life on the land was the same. The clay gradually hardened into rock, which enclosed these animal and vegetable forms and held them firmly embedded. In some places this hardening process was so rapid that air was completely excluded from the buried forms before decomposition set in. The animals, fishes and plants remained in their rocky depositories in a state of perfect preservation for centuries. But changes in the earth's composition are constantly taking place. Improvements made by a natural shifting of the strata gradually caused conditions which admitted air to the imprisoned fossils. Disintegration ensued. The result was Petroleum crude oil. It is probable that this decaying matter which has been encased in the rocks for millions of years does not always result in the formation of Petroleum. The presence of other chemical elements is necessary to this, but what they are is one of the mysteries of science. All that chemists know is that Petroleum is a mixture of carbon and hydrogen. But they do not know the proportion in which these elements are combined to make it. Attempts to analyze it have always failed, and no means of manufacturing it artificially has ever been devised.

At the end of this period another climatic change took place. It is an indisputable fact that every layer, seam or change in the earth's formation represents a climatic period in the earth's age. During the several climatic changes the earth has become thicker and heavier. The method in which stratification, by the agency of water, has been effected in bygone times may be understood by a study of the manner in which successive layers of gravel, sand, mud and other formations are deposited in a river or running stream; the same process has been at work through all the periods of time. Sand formations are comminuted fragments of igneous, metamorphic or volcanic rocks, or of chert, flint and other hard formations. They are detached from the parent rock, and as boulders and pebbles are ground against each other by water or in any similar way. The colors of sand correspond to those of the minerals in the rocks from which they were detached. It may be red, white, gray or black, but when quartzose, as it often is, it is normally reddish-yellow, from oxide of iron. The greater part of the earth's crust, in nearly every land, is found to be thus stratified. Strata may be conformable or unconformable. In the former case there generally is a considerable approach to parallelism among them. It is, however, inferior in exactness to that of cleavage planes. Strata laid down by water, as a rule, retain fossil remains of the animals, fish, mineral and vegetable plants imbedded in them when they were soft and plastic. Metamorphism generally destroys those organic remains, but leaves the stratification undisturbed. Thus, there are two kinds of strata, sedimentary and metamorphic, nearly synonymous with fossiliferous and non-fossiliferous stratified rocks. Most strata have a dip and a strike. The fossils will in most cases show whether strata are lacustrine, fluviatile or marine. They prove that deposit was very slow. One stratum may overlap another, or a stratum may thin out, or an outcrop of it may exist. As a rule the lowest are the oldest, but some great convulsion may have tilted over strata in limited areas, so that the oldest have been thrown uppermost. A study of the same beds over a wide expanse of country prevents error in estimating the relative age of strata thus reversed. The thickness of the stratified rocks is believed to be about twenty miles, or one hundred thousand feet thick; thus it is proved that between every sand and fossil formation there is a raw or baked clay, shale or slate formation. As the earth has been constantly growing and at the end of each climatic change it has added another layer on top of the several layers that form the earth; and since it is a fact that below and above each sand layer or porous lime formation impenetrable layers of slate are found which are imprevious to gas, oil or water, it is made plain for the reader to understand since the earth is round and the oil, water and gas are unable to pass through the shale or slate underlying the porous sand or lime formations, the weight above bearing down upon the sponge-like sand rock forces the gas, oil and water into the pores or cavities of the sand rock. As the water is heavier than the oil or gas, it is found in the bottom of the porous part of the sand or lime formations, the oil next and the gas on top. This explains the fact that at every oil well drilled, where gas or oil is found, the gas comes first, the oil next and the salt water last. It is a known fact the deeper the sand or lime formation that contains oil and gas, the greater is the rock pressure. For example, the highest rock pressure found in the Kansas gas field is four hundred pounds. The wells are from seven to nine hundred feet deep. The highest rock pressure found in the Findlay (Ohio) and Indiana gas fields was seven hundred pounds. The wells are one thousand to thirhundred feet deep, while the greatest rock pressure is found in the gas wells in Wetzel county, West Virginia. These wells are thirty-two to thirty-five hundred feet deep, and at a number of them the rock pressure has run up to fifteen hundred pounds. For a further and more simple explanation take a rubber ball, fill it with water and plug the hole with a stick.

Lay the ball on a table or anything that is solid, then place a brick on the ball, pull the stick out and see the result. Fill the ball again with water and plug it with the stick and place two or three bricks on it. Pull the stick out; you will notice that there is a greater pressure on the ball and it squirts the water further. This is the same case with the gas and oil bearing formations. The sides or edges run out thin and closed or round like a ball. The gas, oil and water cannot pass off through the slate in the bottom or through the slate on top, hence it is kept in prison until the drill releases it as the stick releases the water in the ball. All oil wells have more or less gas, but the volume may be small. If the gas is confined in the well for a short time it may raise a rock pressure of from two to fifteen hundred pounds. This is the power that makes the wells flow and is thus explained as the oil or salt water fills up the hole above the gas. It shuts the gas in and as the gas increases in pressure it raises the oil in the well until it has gathered pressure enough to shove the oil out at the top of the hole. This is called a flowing well. A shallow well does not require as much pressure of gas to make it flow as does a deep well. After the head of oil flows out the gas makes a wild, roaring noise, as though it wanted to tear down the derrick or tanks. This noise is made from the pressure of gas that was required to flow the oil out and free the hole. The gas then escapes without any pressure and goes steadily until the well begins to gather another head of oil. After the gas weakens in pressure and volume the well is tubed with two-inch tubing and packed with a rubber packer above the producing sand.

Near the bottom of the hole, in some of the shallow fields, the wells are tubed with one and one-fourth-inch tubing with a rubber wall packer above the producing sand, near the bottom of the well. After the gas gets weak and the well ceases to flow, the tubing and packer are pulled out, and the well is then tubed with two-inch tubing and rodded and put to pumping.

HISTORY OF THE ORIGIN OF LUBRICATING OR HEAVY OIL.

All natural heavy or lubricating oils at one time in the early periods of the earth contained the same specific gravity as all other light or high-grade oils. During the periods of eruptions of the earth, caused by volcanic upheavals or uplifts, which rent the earth, causing crevices and avenues through the several layers of strata which form the earth, an avenue of escape was given to the gas, oil and salt water that was imprisoned in the lower and older rocks. Gas, as it is now known, is the light, gaseous body arising from the animal, marine and vegetable bodies in decomposition, and the salt water from the marsh flooded by the tide. As the gas was held in solution with the oil and salt water in the sand or lime strata it was in a semi-liquid body, but as it was the lightest, and as it rose to the middle layers or strata, it freed itself from the salt water. As it gradually rose to the upper strata it freed itself from the oil, and at a great number of places it comes to the surface through fissures in the rock and is called gas springs. In many places where oil springs or oil seeps occur this is caused by the gas under-pressure raising the oil near the surface before it is able to free itself. This gas and oil have taken hundreds of thousands of years to get to the surface of the earth. In these countless years the oil was seeping through the several strata of the earth. In its ascension it lost its volatile constituents through long exposure in passing through the several layers of strata, and in this way the gravity was changed from 43° to 28° and 29° gravity. It is known that as soon as a high-grade oil comes to the surface of the earth a large amount of gas leaves the oil, and at once the oil begins to evaporate. This evaporation constantly takes place and the so-called old oil that is stored in large iron tanks at the several places in the oil regions is always mixed with fresh or newly produced oil before refining. The loss in evaporation as well as in the gravity of the oil has always been very great. When it has been stored in tanks and held from ten to fifteen years on the expectation of a great increase in its marketable value, these drawbacks were noticeable, to say nothing of the cost of storage eating up the profit.

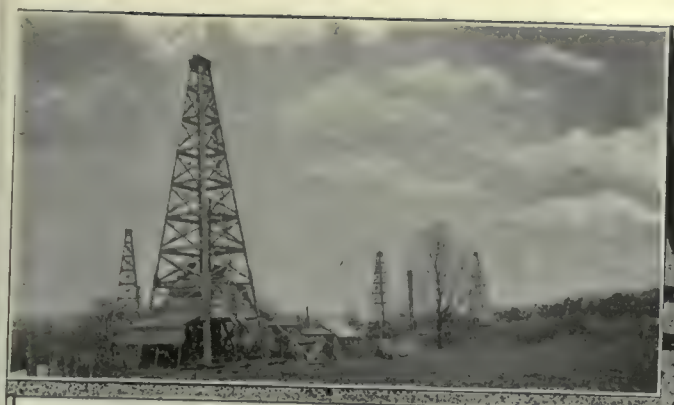
The natural lubricating oil, used to oil all kinds of machinery, is produced in the Franklin lubricating oil district at Franklin, Pa. The Petroleum and Volcano lubricating oil is produced at Volcano, W. Va. The Mecca-Belden lubricating oil is produced at Mecca, Ohio. The lubricating oil market in the lubricating oil districts is from three to four dollars a barrel of 42 gallons of oil.

SUBTERRANEAN TEMPERATURES OF DEEP WELLS AT WHEELING, W. VA., AND PITTSBURG, PA.

BY W. HALLOCK.

The question as to the conditions which exist in the interior of the earth has always attracted much attention. The most important factor in the solution of this riddle is the determination or estimation of the temperatures there existing. The British Association has for years seized every opportunity to obtain data as to the rate at which the temperature increases as the earth's crust is penetrated. Some of the most recent and reliable contributions on this subject are by Mr. E. Dunker, of Halle, Germany, and were obtained from a 4,170-foot well at Sperenberg, not far from Berlin, and a 5,740-foot well at Schladabach, near Leipzig.

Early in 1891 a number of the most enterprising citizens of Wheeling, under the name of The Wheeling Development Company, finished a well near Wheeling, on Bogg's Run, on the farm of Squire Keltz. This well was 4,500 feet deep, 4⅞ inches diameter and *dry;* cased only to 1,570 feet. The strata there are nearly *in situ,* undistorted and dipping only fifty feet to the



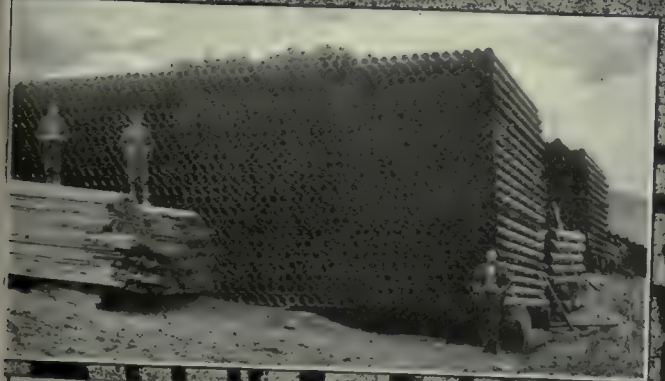
UPPER GLADE OIL FIELD
WARREN, PA.



AFTER THE EXPLOSION AT THE PHILADELPHIA
CO'S GAS PUMP STATION AT DELANEY WEST VA.



THE DEEPEST WELL IN AMERICA.
DRILLED BY THE U.S. GOVERNMENT AND THE FOREST OIL CO AT WEST ELIZABETH, PA



$50,000 PILE OF CASING
WOLF SUMMIT, WEST VA OIL FIELD.



HAULING CASING
McDONALD OIL FIELD, McDONALD, PA.

mile. More satisfactory geological conditions can scarcely be imagined.

The well being dry, ordinary United States Signal Service maximum thermometers were used, and special tests showed that no precautions needed to be taken to prevent circulation of the air. The thermometers were lowered and raised, and depths measured by a steel wire:

Results:

TABLE I.

DEPTH FEET.	TEMP. FAHR.	DEPTH FEET.	TEMP. FAHR.
1350	68°.75	3125	88°.40
1591	70 .15	3232	89 .75
1592	70 .25	3375	92 .10
1745	71 .70	3482	93 .60
1835	72 .80	3625	96 .10
2125	76 .25	3730	97 .55
2236	77 .40	3875	100 .05
2375	79 .20	3980	101 .75
2486	80 .50	4125	104 .10
2625	82 .20	4200	105 .55
2740	83 .65	4375	108 .40
2875	85 .45	4462	110 .15
2990	86 .60	....	.....
		100	51°.30

These observations when plotted show a slow increase for the upper half of the uncased portion, about 1° F. for 80 to 90 feet, whereas the lower part shows a more rapid increase, about 1° F. for 60 feet; the whole series giving a well-defined and regular curve, with a slight deflection at 2,900 to 3,000 feet, where oil sand occurs. Practically all the rest of the uncased well is in shale. The increase in the rate at which the temperature rises as the bottom is approached can only be temporary, or we should have an inconceivable or improbable state of temperature at comparatively slight depths.

The two distinct series of observations combined in Table I. nowhere disagree more than 0°.3 F. and hence may be looked upon as very reliable and accurate.

Table II. gives a comparsion of the results at the four great wells.

TABLE II.

NAME OF WELL AND LOCATION	FEET FOR 1° FAHR.	TOTAL DEPTH	TEMPERATURE AT TOP	TEMPERATURE AT BOTTOM
Sperenberg, near Berlin	59.2 ft.	4170 ft.	47°.8 Fahr.	118°.6 Fahr
Schladabach, near Leipzig	65.0	5740	51 .9	135 .5
Wheeling Development Co.				
Top and greatest depths	74.3	4500	51 .3	110 .3
Mean of lower 3,000 ft.	75.4			
Pittsburg, Peter's Creek	71.5 to 5000 ft.	5386	51 .0	at 5000 ft. 120°.9

A series of observations in a coal mine near the well gave us a very probable value of the temperature of the top invariable stratum 51°.3 Fahr. From the mean and annual temperature of Marietta and Stubenville as reduced by Schott it might be taken at 51°.5 Fahr.

Samples of air were taken at the bottom of the well, but their subsequent analysis revealed nothing of especial interest.

This well was drilled by T. S. Kinsey and his two sons, of Wellsburg, W. Va.

When the observations of 1891 were finished, an oak plug was driven into the top of the casing and thus the hole protected. In July, 1893, the hole was opened, and it was found full of fresh water to within forty feet of the top, having leaked full in something less than two years. Those who should know have no doubt that this water entered at the lower end of the inner casing, i. e., at 1,570 feet below the surface.

It was very desirable to obtain a series of temperatures with the water in the well, to discover the extent to which its circulation would or does effect the distribution of temperature in the hole.

The ordinary signal service mercurial maximum thermometers were used, inverted, as in 1891. They are enclosed in a heavy, sealed glass tube to protect them from the pressure of the water, and were used in pairs and all corrections applied. The two always agreed within 0°.2 F., except once at 2,669 feet, when one evidently failed to record correctly. The two thermometers were in an iron bucket, three feet long and three inches in diameter at the end of the wire, and two were in an open frame, two hundred and sixty feet from the end of the wire. The temperatures at depths of one, two and three hundred feet were determined with other thermometers separately lowered from the top of the well.

The results are given in Table III. The first column contains the depths in feet; the second, the the corresponding temperatures in degrees Fahrenheit, as they were found July, 1893. In column three are the temperatures interpolated from Table I., as found in July, 1891. The last column gives the differences, or rise in temperature, in the well in two years

At 3,200 feet an obstruction occurs, which I was not able to remove with the available tools and which temporarily prevented an investigation of the lower 1,300 feet of the well. A glance at the fourth column in Table III., shows that the temperatures in water in 1893 are practically identical with those in air in 1891.

TABLE III.

Depth in feet	Temperatures in Fahrenheit.		1893. mims. 1891
	1893	Interpolated from 1891.	
103	52°.53	.....	.....
206	53.53	.....	.....
311	55.03	.....	.....
1586	70.12	70°.15	—°.03
1921	75.95	73.82	+.13
2055	75.28	75.42	—.14
2276	78.13	77.93	+.20
2396	79.54	79.45	0.09
2539	81.21	81.15	0.06
2669	83.39	82.75	0.64
2793	84.56	84.41	0.15
2937	86.12	86.07	0.05
3057	87.42	87.50	—.08
3196	89.27	89.30	—.03

Only once does the difference amount to 0°.2 Fahrenheit, and these differencs show no evidence of a warming in the top and cooling in the bottom, as we would naturally expect. It seems to me we are thus compelled to believe that there is not an appreciable circulation even of water in a hole of five inches in diameter.

The Forest Oil Company, of Pittsburg, Pa., are at present at work upon a well which is already the deepest on this continent and the third in the world, and will be raised to the second place if care and enterprise can do it. It is already the deepest ever drilled with a cable, its rivals in East Prussia having been put down with rotating diamond core drills. The well, in February, 1897, is 5,386 feet deep, about 6⅛ inches in diameter of casing, which is only a little over 900 feet in depth. The well is dry and has an inlet of gas at a depth of 2,285 feet.

The geological conditions of this well are almost identical with those at Wheeling. The well is on Peter's Creek, on the farm of Wm. Bedell, about 2½ miles west of West Elizabeth and about 12 miles south-east of Pittsburg.

Mr. Young, the vice-president and manager of the Forest Oil Company, has very kindly consented to the use of the well for the investigation of the underground temperatures at that place, and hence we have here a rare chance for obtaining more data as to the interesting question of earth temperatures.

Mr. E. E. Crocker, the superintendent of that section, went with me to the well and was of the greatest assistance, both with advice and hands. The drillers also contributed in a large degree to the ease and success of the expedition. It is indeed gratifying to find "practical men" so interested in scientific questions and so willing to put up with what to them must appear useless trifles. The actual work at the well is in the hands of S. W. Colman, H. A. Stroup, Clif. Young and Eugen O'Brian; Mr. Joseph Kegan having direct supervision of the wells in that particular district. It would be difficult to find a lot of men better qualified to "break the record," and carry this well to its utmost depth.

The thermometers were lowered upon a steel tape marked at every 50 feet, which was wound up upon a spool attached to the shaft of the engine.

A pair of readings was made at 2,250 and 2,350 feet, i. e., just above and just below the inlet of gas. The reading at 2,250 feet was about 78° Fahrenheit, which agrees well with the same depth at Wheeling, but the thermometers could not be let down long enough to give a thoroughly satisfactory reading. The thermometers at 2,250 feet indicated a cooling due to the expansion of the gas amounting to about 14°.

Four thermometers were lowered to a depth of 5,000 feet at 5 p. m. on the 5th of February and taken out at 9 a. m. on the 6th; they gave a record at that depth of 120.9°. This means a temperature of about 127° at the bottom, 5,386 feet below the surface of the earth.

A careful comparison of this record with the Wheeling temperature will show that the two are almost identical for the same depths; for example, exterpolating from the Wheeling well to 5,000 feet we get 119.6° as against 120.9° at Pittsburg.

Science is indebted to Professor I. C. White for the diversion of the Wheeling and Pittsburg wells into scientific channels, and the U. S. Geological survey has generously contributed toward the payment of the expenses incident to these investigations.

In the late spring or early summer it is hoped that a fuller record of the temperatures in the well can be obtained.

The well which stands without a peer on earth is at Paruschowitz, near Reibnik, in Eastern Silesia. More than two years ago it was over 6,500 feet deep, and it was the intention to go to about 8,800 feet (2,700 meters). No recent report has been had from it, and temperature observations were not to be commenced until the well was finished. We may, however, rely upon the Germans to give us a thorough and trustworthy record, when the time comes.

[FROM THE PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, VOL. XLII, 1893.]

NOTE ON FURTHER OBSERVATIONS OF TEMPERATURE IN THE DEEP WELL AT WHEELING, W. VA. BY WILLIAM HALLOCK, COLUMBIA COLLEGE, NEW YORK, N. Y., JULY, 1903.

[ABSTRACT.]

When the observations of 1891 were finished, an oak plug was driven into the top of the casing and thus the hole protected. In July of this year the hole was opened and it was found full of fresh water to within forty feet of the top, having leaked full in something less than two years. Those who should know have no doubt that this water has entered at the lower end of the inner casing, i. e., at 1,570 feet below the surface. This water can be easily bailed out, and will be when drilling is commenced.

I was very desirous to obtain a series of temperatures with the water in the well, to discover the extent to which its circulation would or does effect the distribution of temperature in the hole.

The ordinary signal service mercurial maximum thermometers were used, inverted, as in 1891. They were enclosed in a heavy, sealed glass tube to protect them from the pressure of the water, and were used in pairs and all corrections applied. The two always agreed to within 0°.2 F., except once at 2,669 feet, when one evidently failed to record correctly. Two thermometers were in an iron bucket, three feet long and three inches diameter at the end of the wire, and two were in an open wire frame, two hundred and sixty feet from the end of the wire. The temperatures at depths of one, two and three hundred feet were determined with other thermometers separately lowered from the top of the well.

The results are given in Table I. The first column contains the depths in feet; the second, the corresponding temperatures in degrees Fahrenheit, as they were found in this July, 1893. In column three are the temperatures interpolated from Table II, as found in July 1891. The last column gives the differences, or rise in temperature, in the well in two years.

At 3,200 feet an obstruction occurs, which I was not able to remove with the available tools, and which temporarily prevented an investigation of the lower 1,300 feet of the well. It is not serious —a heavy tool will easily open the well completely. A glance at the fourth column in Table I shows that the temperatures in water today are practically identical with those in air two years ago.

TABLE I

Depth in Feet	Temperatures in Fahrenheit		1893. Mims. 1891.
	1893	Interpolated from 1892	
103	52°.53	.....	.....
206	53.53	.....	.....
311	55.03	.....	.....
1586	70.12	70°.15	—°.03
1921	73.95	73.82	+.13
2055	75.28	75.42	—.14
2276	78.13	77.93	+.20
2396	79.54	79.45	0.09
2539	81.21	81.15	0.06
2669	83.39	82.75	0.64
2793	84.56	84.41	0.15
2937	86.12	86.07	0.05
3057	87.42	87.50	—.08
3196	89.27	89.30	—.03

TABLE II.

Depth in Feet	Temperature, Fahr.	Depth in Feet	Temperature, Fahr.
100	51°.30	2990	86°.60
1350	68.75	3125	88.40
1591	70.15	3232	89.75
1592	70.25	3375	92.10
1745	71.70	3482	93.60
1835	72.80	3625	96.10
1992	74.50	3730	97.55
2125	76.25	3875	100.05
2236	77.40	3980	101.75
2375	79.20	4125	104.10
2486	80.50	4200	105.55
2625	82.20	4375	108.40
2740	83.65	4462	110.15
2875	85.45	....	.....

Only once does the difference amount to 0°2. Fahrenheit, and these differences show no evidence of a warming in the top and cooling in the bottom, as we would naturally expect. It seems to me we are thus compelled to believe that there is not an appreciable circulation even of water in a hole of five inches in diameter.

All the results, down to 3,200 feet, give a gradient of 1° Fahrenheit for every 81.5 feet, whereas the last few hundred feet show about 1° Fahrenheit increase for every 60.0 feet. The expense of these supplementary tests were born by the United States Geological Survey and it is with the Dirctor's permission that this note is published.

Development of Illumination and the First Use of Oil for Light and Heat.

The Invention of the Kerosene---Refining Process of Crude Oil and the Invention of Lamps with Air Burners and Glass Globe Chimneys.

Before the period of artificial illumination there were many manifestations of light in nature coming to the aid of the denizens of the earth during the hours of darkness. Of these were the so called luci-form appearances, including the aurora borealis and australis, which enliven the long nights at the polar zone; the magellan clouds of the Southern Hemisphere; the zodiacal light, whose cause was long a subject of speculation, and the diffused light of the milky way, known to the Chinese as the "river of the sky."

The light from the stars and planets is not inconsiderable. Under the clear night of the Arizona deserts the atmosphere seems charged with star mist; eminences miles away may be outlined, the dial of a watch may be read, and a trail followed with little difficulty. These are the conditions under which night journeys are made to avoid the burning sun. The planet Venus, at inferior conjunction especially, sheds light sufficient for the traveler over open country.

There are at times nights of remarkable luminescence. Clouds become phosphorescent, and often under certain states of electric stress, during high winds, glimmer with a faint light not amounting to a discharge of the electric fluid. Frequently successive flashes of "heat lightning" aid the traveler in finding his way. It is possible, also, that the soil over certain regions may become phosphorescent under the light of the sun and retain the property during the night, as certain gems are phosphorescent after being submitted to sunlight. Snow has this property. Gaseous emanations of a phosphorescent character are occasionally abundant enough to produce temporary illumination.

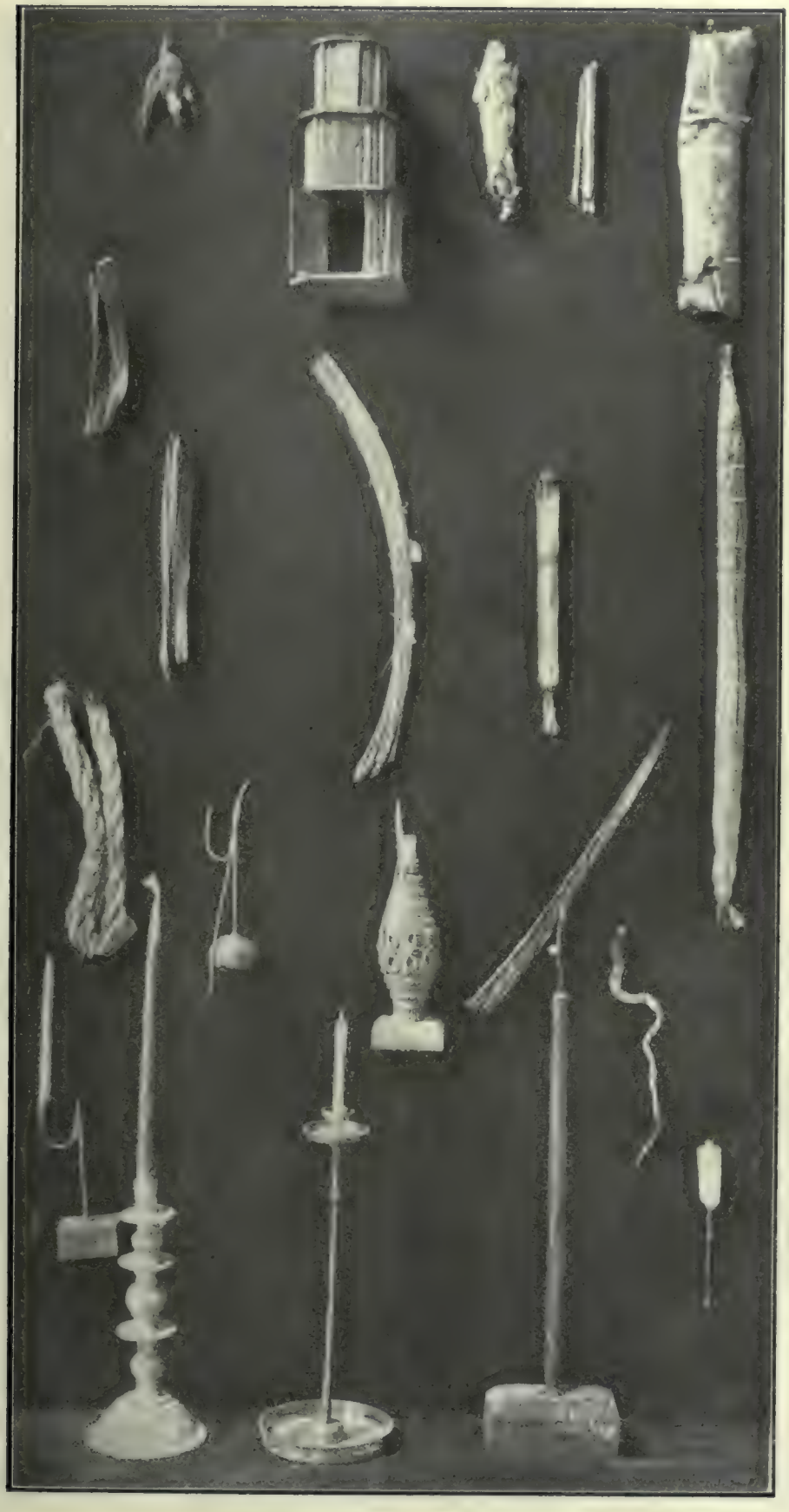
Next to the sun in value to man as a light producer is the moon. Though intermittent in the power and duration of its light, the moon has proven a valuable auxiliary on the night side of man's life, and its period has given a measurement of aggregates of time.

In torrid climates, and at hot seasons of the year, work is often carried on by moonlight in order to escape the heat of the day. While moonlight is 450,000 times less bright than daylight, under certain favorable conditions the light seems intense and ample for many purposes.

The well-known phosphorescence of lichens has been found to give considerable light during warm moist nights in the summer. Certain flowers are phosphorescence, or emit flashes of light, as the tuberose and moonflower. In the vegetable world there are numerous sources of light whose faintness cause them to escape ordinary observation. As an aid to man, however, the light from the vegetable kingdom is far less useful than that yielded by the animal kingdom.

When the animal kingdom is reached, numerous examples of light phenomena connected with vital processes are found. The familiar firefly of northern latitudes frequently renders summer nights luminous, while the tropical noctilucidae yield an actual and valuable illumination which has been utilized as light in several interesting ways by the inhabitants of regions in which the insects are found.

The distinguished traveler Kaempfer described the fireflies of Siam as "settling upon the trees like a fiery cloud," and in Brazil Gardener compares them in brilliancy with "stars that have fallen from the firmament and are floating about without a resting place." Kidder says: "In the mountains of Tijuca, I have read the finest print of the American newspapers by the light of one of these natural lamps placed under a common glass tumbler, and with distinctness I could tell the hour of the night and discern the very small figures which marked the seconds of a little Swiss watch. The Indians formerly used them instead of flambeaux in their hunting and fishing excursions, and when traveling in the night they are accustomed to fasten them to their feet and hands. And they are used by senoritas for adorning their tresses. Prescott narrates the terror they inspired in the Spaniards in 1520. 'The air was filled with "cocuyos," a species of large beetle which emits an intense phosphoric light from its body strong enough to enable one to read by it. These wandering fires seen in the darkness of the night were converted by the besieged into an army of matchlocks,' so says Bernal Diaz."



ANCIENT TORCHES AND CANDLES



ANCIENT OIL LAMPS

The bearing of the light of the firefly on the light of the future is very important, and the investigations carried on at the Smithsonian Institution a few years ago may introduce a new epoch in illumination. Some interesting experiments on the nature and origin of the light emitted by the firefly have lately been made by Prof. S. P. Langley. From the stereoscope he finds the light to be of exceedingly narrow range of refrangibility. The heat given out is scarcely appreciable, being less than one-half of 1 per cent of that produced by an equal amount of light from a candle or other common illuminant. That the light is a chemical product would seem to be established by the fact that it decreases by products which check combustion (e. g., nitrogen), and increase by products which aid combustion (oxygen), and that the product of the process is apparently carbonic dioxide. The subject of the origin of 'phosphorescent' light is one that may developed very interesting features, for as graphically stated by Prof. Oliver L. Lodge, if the secret of the firefly were known, a boy turn a crank might be able to furnish the energy necessary to light an entire electric circuit. From this standpoint Professor Lodge regards as enormous the waste of energy in the machinery of electric light making now in use."

Most of the 150 species of animals which are light producing inhabit the sea, where their light is of small importance to man. The wonderful phosphorescence on the tropical seas, which has drawn forth many descriptions of its beauty, is caused by the collective lights of myriads of infusoriae on the surface of the water.

The day opens up a vast field of activities requiring light for their prosecution. Solar light is normal for the carrying on of these activities, and the night is normal for rest and recuperative processes. The important phenomena of the day are sunrise and sunset; and the day's labor regulates itself to twilight, morning and evening hours, and the hours of broad day divided by the meridian of the sun. Sunrise is attended with certain phenomena, which observant people have noticed.

The Hopi tribe of Arizona, for instance, employs the following terms for sunrise: *talavaiya;* place of sunrise, *tawa yum tyaki;* faintest dawn, *kuyaniptu;* first light, *talti;* light of sunrise, *talaove;* yellow light of sunrise, *sikyanupti;* before emergence of sun, *tawa kuyiva,* "sun appears;" sunup, *tawa yama.* Few tribes indeed have not been impressed with dawn and sunset, and few in oblique latitudes have failed to mark the seasonal progress of the sun along the horizon.

There is a wide difference in the amount of sunlight enjoyed by the dwellers on the earth's surface, depending on the height and configuration of the land, its absorptive and reflective qualities, the presence of forests and vegetation, the amount of moisture and dust in the air, cloud formation, and other elements which suggest themselves to the reader, producing local and periodical variation. To these must be added the seasons and the position in latitude determining the length of the day and duration of twilight.

The superabundance of sunlight has brought many devices for warding off and tempering the rays and ameliorating their heat. For protecting his eyes from the excessive light man has devised eyeshades, hats, and parasols; and for shade and protection from the heat, shelters of brush, skin, or cloth. In some environments the chief function of the house seems to be for shetler against a burning sun, and this points out a probable origin of the house in tropical countries.

Nowhere is this regulation of daylight more thoroughly carried out than in our modern houses of the temperate regions, whose development has been along praiseworthy lines of more light and air. What the ancients directly accomplished by small light openings requires now hangings, lace curtains, inside shutters, blinds, perhaps sash curtains, outside shutters, and an awning. These may be further reinforced by shade trees. With all these adjuncts one might be led to believe that the dim light of the early houses is still preferred by the moderns.

As a corollary of protection from the sun follows the observation that tribes living in the shade become lighter in color than their fellows living in the open country. It is also true that there is a characteristic facial modification, such as wrinkling and contorting about the eyes produced in those who are exposed to the glaring light of the deserts or the sea.

Without doubt man is a diurnal animal; his eyes have not the condensing power of those of the Felidæ and other nocturnal beasts. The man apes are also day animals, and those tribes of mankind retaining a degree of primitiveness regulate their rest to the setting and rising of the sun.

With the use of fire begins the history of artificial illumination. The nocturnal light of nature became then of little moment in comparison with fire lights and the burning brand in the hand of man; the conquest of light over darkness was signalized and the night side of man's life and his progress toward culture became a theme of surpassing interest.

There perhaps cannot be a satisfactory reconstruction of the period before the knowledge of fire, and the difficulty persists in the subsequent stages of the acquisition and use of fire, and the generation of fire at will—stages grasped by the philosophic mind of Paul Broca.

One fact stands out clearly—that man unacquainted with fire is unknown. With the light of the camp fire comes the torch and from this starting point, by the help of observations on less civilized peoples, it may be possible to reconstruct the history of artificial illumination and to check it in some degree by the aid of archaeology.

The following table, briefly epitomizing the development of the candle, is presented as the result of extended research in this direction:

DEVELOPMENT OF THE CANDLE.

Protoillumination in lieu of torch:

Fireflies used as torches. Fat bodies of birds and fish burned for light.

Prototorch (adventitious and temporary):

1. Firebrand, branches, resinous wood, bark, leaves, etc.

Torch (for customary use):

2. Slivers or other elements tied together in a bundle.
3. Roll of resin wrapped in leaves.

Protocandle:

4. Rope soaked in resin.
5. Fiber soaked in fat or wax.
6. Rush soaked in grease.
7. Stick or splint with grease for lighting.

Candle:

8. Mass of fat formed upon a stick around which is wound a wick of fiber.
9. Candles of wax or fat.
10. Dipped candles.
11. Molded candles; improved and art candles of twentieth century.

While the line of development has proceeded from the rude torch to the candle, the steps marked in the series are suggestive, embracing devices used by different peoples and at divers times. There is not space here to present the result of investigations among different peoples and in special areas. It will be seen that the purpose for which light is to be used, the place in which it is to be used, the period, and the resources of the environment, are among the modifying influences on materials and apparatus. Hence the complete steps of the development may not be exemplified in a given area, though a number of superposed phases of light utilization may exist side by side. It is true, also, that the growing need of light has brought a closer association of the means of illumination with the life of man. The smoking torch, for example, is utilized for open air illumination, while the candle enters the house and companionship of the family.

Following the torch in the line of development comes the lamp, which separated from the stem of the torch at a period when oils and fat came to be used. This may have occurred (1) as a concomitant of migration or after the domestication of animals whose fat was available; (2) at the time of the discovery of mineral oil, (3) or of the utilization of vegetal oils, such as that of the olive and the cocoanut.

The lamp appears to have arisen at a period after migrations into the temperate zones had brought man into new conditions. The principal of these was the longer night, and joined to this was the settlement in comparatively permanent habitations. In this view the fire stick and torch were the essential accompaniments of early migration and without doubt determined the spread of man over the earth's surface.

Since the torch, from its perishable character, is rarely found on ancient sites, there is little to be said as to its archaeology. The lamp, on the contrary, being a higher idea, involves work in stone, pottery, bronze, or iron, producing objects which survive burial in the soil. Discoveries by French archaeologists have shown that the lamp was in use at the close of the lacustrian bronze age, and up to the present time these are the most ancient objects which have been found that are unmistakably lamps.

It would seem that the lamp with a wick had its origin at a culture plane represented by that of the bronze age, though such employment of fire might have been prefigured by usage in the age of polished stone. Again, the latitude and consequent difference in temperature of stations have exerted controlling influence on the character of the early lamps which it might be possible to employ. Thus climatic conditions render the fuel supply of the lamp or fluid and broadly determine the form of the reservoir.

It is almost safe to say that the higher types of illuminating apparatus would not have been developed except in the temperate zone or the region of long nights. The tallow candle is a device of cold regions; the same may be affirmed of the open fat lamp. The form of the latter seems to depend upon the character of its fuel supply, and this cause no doubt constantly gives rise to forms of extreme primitiveness in the midst of a high civilization, aside from those descending from the primitive type and retained in use through the working of the large body of survivals of custom in every society.

DEVELOPMENT OF THE LAMP.

The series might have grouped at the beginning devices for producing a temporary light and those undifferentiated lamps of skulls and bones. The bodies of birds and fish burned by means of a wick also may be classed with the lamps.

1. Oil bag from which oil is thrown on a fire to produce a temporary light. Kwakiutl Indians, British Columbia. Lighting apparatus of skulls or bones suggestive of primitive lamps.

2. Lamp. Unworked beach stone with a cavity supplied with oil and having the wick laid along one edge. Aleut shell heaps.

3. Lamp. Hollow beach stone with moss wick arranged along one edge. Worked stone lamps. Eskimo.

4. Lamp of pecten shell with oil wick of rush pith. Anios, Japan. Fusus shell hanging lamp. Orkney islands.

5. Lamp. Terracotta saucer, China. India, etc.

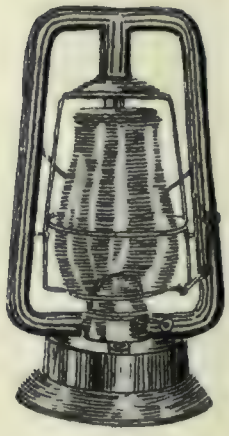
6. Terracotta saucer with edge pinched up into gutter or gutters for wick. Syria and India.

7. Lamp. Terracotta. Reservoir almost closed over; spout for wick. Lamps of pottery with reservoir almost closed over; spout for wick. Lamps of pottery with reservoir closed over. Lamps of bronze with one or more wick spouts. Roman.

8. Lamps of iron of simple shape with plain open or closed reservoir and with spout, and often hav-



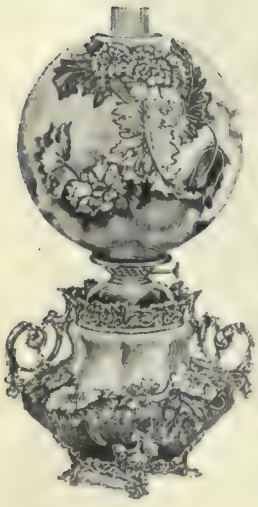
















MODERN LAMPS AND LANTERNS, FOR BURNING REFINED OIL

ing dip catchers and a device for tipping to allow the oil to reach the wick. There is considerable variety of such lamps, which were used in Europe before the epoch-making invention of Argand. Being products of the blacksmith's hammer, they present a certain crudity, as of antiquity. However, there is no reason to doubt that they are the survivals of the forms of the iron age.

It may be interesting to briefly pursue the line of the lamp into the inventive age.

LAMPS OF THE INVENTIVE AREA.

9. Lamp of brass with reservoir mounted on rod and stand; several curving spouts. Italian. Development from the Roman lamp.

10. Lamp of brass designed to furnish heavy oil to the wick under hydrostatic pressure. Flemish.

11. Lamp with chimney; draft to flame and heavy oil under gravity pressure. Argand's invention and French inventors.

12. Lamp with chimney and Argand burner; heavy oil under forced pressure of a spring. Devices for heating heavy oil. France.

13. Lamp of glass having one or two tubes; for burning whale oil.

14. Lamp burning "camphene" by means of wick and tubes and without chimney. United States.

15. Lamp with chimney; ventilated burner; woven wick raising refined pertoleum by capillarity. United States, 1870. Developed burner to end of century.

At present the destiny of illumination is in the hands of the investigator and inventor. Who knows to what heights their efforts will lead? But before the inventive era, before Argand, if you please, the world satisfied its needs for light with the immemorial simple lamp and smoky torch, increasing the illumination at times by multiplying the number of lights, and casting over scenes of splendor the flare of torches little removed in simplicity from those of prehistoric man.

It may be a wholesome correction of our pride in the advance of a century to reflect that most of the human race is still in the uninventive period, depending for light on torches and simple saucer lamps.

The epoch-making invention of the chimney and the discovery of boundless hydrocarbons in the earth have not yet reached the majority of mankind, while the electric light casts its bright rays in a very small area of immense obscurity. Still there is progress, and gradually tribes from their beginnings unacquainted with more than the most simple illuminating methods are seeking more light.

It is interesting to note in this connection the education of the Hopi Indians of Arizona in the use of artificial illumination. The environments of these Indians is semiarid, and there is such scarcity of fuel in their isolated country that it must be used sparingly for cooking and only as a luxury for illumination. Hence, up to a few years ago, all avocations ceased at dark. Four years ago the writer, while encamped at Walpi, noticed only a solitary light at night in the pueblo. There was at that time a demand for candles Two years later a number of lights shone from the windows of the village. Lately kerosene oil has become known; a great many families possess the luxury of a kerosene oil lamp, and this has worked a great change in the habits of people. This seems in epitome the history of illumination.

A SCIENTIFIC PROBLEM FOR THE CAUSE OF THE FLAME OF A TORCH, CANDLE, OIL LAMP OR LANTERN SOLVED.

A burning torch, candle, oil lamp or lantern is a small gas factory. No matter in what state any material is, whether it is a solid like wax and tallow, or a liquid like alcohol, crude or refined oil, it must first be converted into a gas before we can have a flame. The only difference between a torch, candle, oil lamp and lantern and the sources of natural gas or gas factories is that the gases of the torch, candle, lamp and lantern are not made at a distance and conveyed by means of pipes to distant burners, but they are manufactured on the spot and consumed as fast as they are made. Our ordinary candle is made of oil, wax and tallow, a solid which consists mainly of two substances. one of which is called carbon, the other hydrogen. The burning of the wick melts the wax or tallow near it. This molten wax or tallow is absorbed by the wick and carried to the flame. It is the same the liquid is changed into gases. The decomposition of the molten wax or tallow is absorbed by the wick and carried to the flame. It is the same with the torch and lamp and lantern. The oil is absorbed by the wick from the reservoir and carried to the burner where it is changed into gases. The decomposition of the molten wax and tallow and the heating of the oils yield acetylene gas, marsh gas and olifient gas, and these burn with a flame. By burning we mean that the carbon and hydrogen of these gases unite with the oxygen of the air with sufficient heat to make a flame. Flames may be luminous, as the ordinary yellow gas flame, or non-luminous as the bluish flame you get in your gas stove. The ordinary gas flame is a luminous particle of carbon which, set free by the burning, is made to glow. You can prove this statement by holding a cold plate or any cold object so that the open flame of the torch, candle or lamp will strike it. After holding the object over the flame a short time, remove the object, and you will see a deposit of carbon black commonly called soot. This soot is the carbon which has come from the acetylene gas. The great heat of the flame makes the finely divided carbon particles glow in the flame. The light of the Welsbach incandescent is due to the glowing of the incombustible materials of which the mantles are made. The same can be said of the glass and other materials used in making torches, lamps and lanterns.

HISTORICAL DATA.

Before proceeding to an account of the oil trade which relates to the world, it is proper to describe the chemical character of Petroleum. As expressed by the etymology of the word, it means rock oil.

From the Encyclopedia Brittanica the following quotation is made: "The proximate principles of Petro-

leum have been determined and examined chiefly by Schorlemmer in England, Pelouze and Cahonis in France and C. M. Warren and S. P. Saddler in the United States. Many other chemists have contributed valuable assistance to the work. These researches have established the fact that Pennsylvania Petroleum consists chiefly of two homologous series of isomeric compounds, having the general formula C_nH_{2n+2}, at one extremity of which marsh gas is found, and solid paraffine at the other." In other words, Petroleum is a compound of a series of animal, mineral, marine and vegetable hydro-carbons, beginning with a union which contains the smallest possible quantity with the largest possible quantity of hydrogen which could unite with such an infinitesimal particle of carbon, and descending in the series with each union in the course containing less hydrogen and more carbon than the one above it, until the union last formed is all carbon, except the faintest conceivable trace of hydrogen. This last in the series is solid paraffine, while the beginning, next to pure hydrogen, is the lightest of gases. Petroleum, therefore, includes not only oil of various gravities in a liquid state, but also the substance spoken of in the oil country as "natural gas," and also paraffine, whether in a semi-liquid or a solid condition. Heavy oils contain more carbon and less hydrogen than oil of lighter gravity. Ohio oil and Baku (Russia) oil are noted for the large amount of carbon in their composition, while most of the oil produced in Western Pennsylvania, excepting the Bradford oil, has less carbon. The yield of illuminating oil is, of course, greater from Pennsylvania oil than from that produced in Ohio, Texas or Oklahoma. This is because of the excess of carbon in the latter. It is well to note the fact that the great bulk of oil produced in the United States is found on the western slope of the Alleghany Mountains, or upon the plane of their base, though in part, as in Ohio and Indiana, some distance westward from the foot of the slope. Oil is found in Colorado, Kansas, Texas, Wyoming and California in paying quantities.

As early as 1833 the older Silliman, of Yale College, contributed to the *American Journal of Science* an interesting account concerning a Petroleum spring near Cuba, in Alleghany county, New York, after he had in person visited the spring and examined the oil upon its surface. Nearly fifty years later there was opened in the vicinity of this spring a large territory of oil production. In 1855 the younger Silliman made a thorough chemical analysis and test of oil brought from Venango county, Pennsylvania, the results of which he embodied in a report to Eveleth & Bissell, of New York.

MANUFACTURE OF PETROLEUM PRODUCTS

COMMUNICATED TO THE SOCIETY OF ARTS, MASSACHUSETTS INSTITUTE OF THEOLOGY, MARCH 14, 1872, BY S. DANA HAYS, STATE ASSAYER AND CHEMIST FOR MASSACHUSETTS, ETC., ETC.

By referring to any authentic shipping-list, the number of thousand gallons of crude and refined Petroleum sent away from the United States every day and week may be ascertained; and very little search in this direction develops statistics that are surprising to persons previously unfamiliar with them. As, for example, the total value of the crude and refined Petroleum exported last year (1871), estimated at a low average value of twenty-five cents per gallon, amounts to nearly *thirty-five millions of dollars*, in one year. And it is especially notable that a considerable proportion of this material is classed as "refined," and consists of products manufactured from the crude Petroleum of the wells before shipment. There is certainly no other article of commerce exhibiting similar statistics of production and manufacture among the industries of this country.

The object of this memoir is to briefly sketch the history and present condition of the manufacture of Petroleum—a manufacture which is of great importance, and which, after the diligent study given to it, and under skillful management, yields products superior to those obtained in Europe and elsewhere, from the same crude material.

Having had uncommon opportunities for making myself familiar with the manufacture of Petroleum products, after careful investigation, and in the correspondence of others, I find it generally acknowledged that to Mr. Joshua Merrill, manufacturing chemist of the Downer Kerosene Oil Company, of Boston, more than to any one else, belongs the honor of bringing this manufacture to its present advanced state; and, as an account of his labors and discoveries in this connection would provide a nearly complete history of the art, I take pleasure in recording some of them in this form.

COUP OIL.—The first coal oil made for sale in this country was produced at the works of the United States Chemical Manufacturing Company, in Waltham, Mass., by Messrs. Philbrick and Atwood, early in 1852. It was made, in connection with the picric acid, benzole and other products, from coal tar; and was named by Luther Atwood, the inventor, "Coup Oil," after the *coup d'etat* of Louis Napoleon, which had taken place a few months before.

This was a lubricating oil for machinery, of which a hundred and seventy-five thousand gallons were made. It was used by many of the largest factories and railroads, and at that time was so highly esteemed that Messrs. Atwood and Merrill were employed to make and sell it in Glasgow, Scotland, for Messrs. George Miller & Co., in 1855 and 1856. But if compared with a neutral hydro-carbon lubricating oil of the present day, it would be considered entirely unmerchantable, on account of its very offensive odor and other comparatively poor qualities.

EARLY EXPERIMENTS.—In 1856 Mr. Samuel Downer, who had previously been a successful sperm and whale-oil merchant, erected buildings in South Boston, and employed Mr. Merrill to manufacture hydrocarbon oils for lubricating purposes especially; and a great many experiments were tried there, on a manufacturing scale, with different forms of apparatus; and to determine the most suitable crude material from which to make these oils.

About four hundred tons of Trinidad bitumen, and one hundred tons of Cuban "chapapote" were con-

sumed, and converted into lubricating and burning oils, during these early experiments. The experience gained in this way, and the many difficulties then overcome, proved of great service in the latter operations at these works.

THE FIRST ILLUMINATING OIL. — Light coal oil products appear to have been used by individuals in this country, for illuminating purposes previous to this time; but upon the introduction of the Knapp and Dietz lamps, which were originally designed for burning resin and other oils, it was found that some of the light hydro-carbons obtained from these West Indian bitumens burned freely in them, yielding a bright and beautiful light as compared with that from the animal oil lamps and candles previously in common use. This was an important advance, and inaugurated the general burning of these hydro-carbons in lamps in this part of the country; the first illuminating oil having been made by Mr. Merrill, from Trinidad bitumen, in 1856.

ALBERTITE PRODUCTS.—In the spring of 1857, the first attempts to use the Albert coal, from Hillsboro, New Brunswick, as a source of lubricating and illuminating hydro-carbon oils, were made at South Boston. But the condensing apparatus, which had been used when distilling other coals and bitumens, was found to be unsuitable for this new material, as a black asphaltum-like substance passed bodily over out of the retorts, and often closed the cool pipes of these condensers. This difficulty was only overcome after six months spent in experimenting by Mr. Merrill, who then invented an atmospheric condenser, which, being constructed of large hollow disks, allowed this tarry distillate to pass through, with the more liquid hydro-carbons, from which it was separated afterward. With this improved apparatus, the Albertite proved such a valuable material that, in the fall of 1857, six retorts, each having a capacity for twelve hundred pounds of coal, were erected in the open air, with the new condensers attached, and together yielded about three hundred and sixty gallons of crude coal oil in twenty-four hours. Twelve more retorts were soon added to these six, out of doors. After Mr. Downer had made contracts with the Albert Mining Company for a regular supply of their mineral, thirty retorts were erected in a substantial brick building; and these were followed by twenty more, the first eighteen having been worn out and removed. These fifty retorts were used for more than four years, and produced at the rate of nine hundred thousand gallons of crude, or six hundred and fifty thousand gallons of refined oils each year—quantities very much larger than were anticipated when the first experiments were made, in 1856.

A very large part of the products from this Albertite mineral were hydro-carbons used for lubricating purposes; and their acknowledged excellence was entirely due to the untiring labor and skill of the manufacturing chemist. It is almost impossible for persons unfamiliar with the distillations of this mineral to realize at the present time, when similar processes are in common operation, how many obstacles there were to success in these early days. Many of the best forms of steam-distilling, and other apparatus now in use, were employed and perfected then.

"CRACKING."—One observation made by Mr .Merrill during the manufacture of Albertite products became of such practical and scientific importance in after years that it is worthy of special description here.

The light or "thin" products, afterwards used as illuminators, were for a long time unmerchantable, and the production of them was undesirable; but it was observed that every time the crude coal oils, or the heavy lubricating oils made from them, were distilled, these thin, light-colored hydro-carbons were invariably produced at first by the distillation, although the oils in the apparatus had been previously fractioned with great care.

This caused so much loss of material that every endeavor was made to prevent it; such as surrounding the upper part of the stills with heated flues, and covering their tops with sand, or other poor conductors of heat. But these efforts to prevent the decomposition only served to demonstrate that any distillation of these hydro-carbons is necessarily *destructive*, and that the light distillates were produced by condensation of vapors in the upper part of the distilling apparatus, which, falling back into the body of the heated fluid, to be again raised in vapor, were thus decomposed, with the deposition of carbon, into lighter and thinner hydro-carbons. Further experiments showed that these hydro-carbons could be so easily decomposed that the *continuous* production of light distillates, having a specific gravity of about .818 (42° Beaume), was effected from hydro-carbon oils having a specific gravity of .880 (30° Beaume) in an apparatus holding a thousand gallons, by properly regulating the heat applied; the other products being only uncondensed gases, and deposited carbon left in the apparatus at the end of the distillation. These light distillates became valuable for use in lamps some time afterward, and the manufacturer's difficulty was thus removed; but the unstable nature of these hydro-carbons, and the ease with which they may be "cracked," was practically demonstrated when endeavoring to overcome an annoyance.

KEROSELENE.—Any account of the Albertite products would be incomplete without mention of the lightest naphtha obtained from it, which was known as "keroselene." This was made by Mr. Merrill in 1857, just after the first successful distillation of the New Brunswick mineral; and it was used in considerable quantities for supplying carburetted air or automatic gas machines, which would have been useless at that time without this material. It was obtained in a crude condition by carefully refrigerating the waste gases as they passed from the outlets of condensers attached to the stills and retorts; this crude material, after agitation with sulphuric acid, was redistilled by steam heat; and the exceedingly volatile keroselene, having a specific gravity of only .634, and which boiled at 85° Fahrenheit, was manufactured in this way.

Mr. Merrill first noticed the anesthetic effects of keroselene upon a laborer engaged in cleaning a tank or cistern which had contained it, at the works; and afterwards experimented further with it upon rats and mice. This discovery of its anesthetic properties was recorded in the medical and surgical journals of that

time, and many interesting results were obtained with it by different members of the medical profession.

PETROLEUM.—I have been unable to find any record of the distillation of American Petroleum, taken from the wells, in a large way; although it was investigated, and the distillates obtained in Pennsylvania Petroleum was not, probably, made into illuminating oil. for sale, before the fall of 1858; although there were fifteen establishments using Petroleum exclusively, in the United States, by the fall of 1860.

During the years 1858 and 1859, several hundred barrels of Petroleum were brought to Mr. Merrill from surface wells; and, on one occasion, a considerable quantity was sent to him for distillation from the famous Tarentum well in Pennsylvania. And afterward the heavy paraffine oils and residuary products from Western establishments, which were considered value less there, were manufactured into lubricating and illuminating hydro-carbon oils at the works in South Boston. As the supply from flowing wells increased, the use of Albertite as a source of fluid hydro-carbons gradually diminished, although it was not abandoned until 1865.

After the trying experiences of former years, no difficulty was encountered in converting crude Petroleum into naphtha, burning oil (called kerosene or "wax-oil"—a patent trade-mark name), lubricating oil and paraffine, similar to those made from coals and bitumens. Petroleum breaks up into thin hydro-carbons by distillation even more readily than the Albertite products; and when large demands are made for burning oil the distilling apparatus is operated slowly, or modified in form, so that the condensed vapors of the Petroleum, or heavy oils obtained from it, are repeatedly heated by being returned into the body of the still; and in this way the yield of the lighter hydro-carbons may be increased at will, the whole contents of the still being converted into burning oil when desirable. This principle is applied to the immensely large wrought-iron stills, holding two thousand barrels, or eighty thousand gallons each, that are now frequently used; they are placed over a number of small fire-places, with the top and upper part of the stills exposed to the outside atmosphere, for the purpose of condensing and returning heavy vapors in the stills.

Petroleum yields, by distillation, nine distinct commercial products.

Name.	Specific Gravity	Beaume Scale	Boiling Point
Righolene	025...	.....	65° F
Gasolene	665...	85	120° "
C. Naphtha	706...	70	190° "
B. Naphtha	724...	67	228° "
A. Naphtha.....	742...	65	300° "
Kerosene Oil	804...	45	350° "
Mineral Sperm Oil..	847...	36	425° "
Neut.Lubricating Oil	883...	29	575° "
Paraffine	848...	.....	

Four of these products are especially interesting and valuable; the first is Righolene. It nearly corresponds to the keroselene of the Albertite products, and is an extremely volatile hydro-carbon, used for producing local anæsthesia, by its rapid evaporation, during short surgical operations. In 1866, Mr. Merrill was requested to make the most volatile fluid he could produce from Petroleum, by Dr. Henry J. Bigelow, the eminent surgeon of Boston. This was done by redistilling gasolene, which was the very lightest Petroleum naphtha, by steam heat, and condensing the first distillate by the aid of ice and salt. In this way, ten per cent. of the gasolene was converted into the lightest of all known fluids, which was named righolene by Dr. Bigelow. Its specific gravity is only .625, and it boils at 65 degrees Fahrenheit. The evaporation of this fluid is so rapid at common temperatures, that it will depress the mercury in a Fahrenheit thermometer to nineteen degrees below zero, in twenty seconds. Several hundred gallons of righolene have been consumed for surgical purposes. We pass next to the neutral heavy lubricating oil. At the works in South Boston, the production of lubricating oils has always been a specialty, but with petroleum there came a scarcity of heavy dense crude materials from which to make these oils; fortunately, however, other manufacturers of petroleum, finding the illuminating oil and light products more profitable, have been glad to dispose of their heavy residuum at these works; and the deficiency of material has been supplied from this source.

The lubricating or paraffine oils were always characterized by offensive odors and tastes, so that a person brought in contact with them become at once aware of their origin; the desideratum with manufacturing chemists, from the earliest days of this industry, has been the production of dense neutral oils, or oils free from these offensive objections. Much time and study have been devoted to experiments having this object in view; and shallow stills, stills with double heads, repeated distillations, different processes of purification by chemical agents, and many other means, have been tried without success. But partly as the result of an accident, Mr. Joshua Merrill succeeded in making neutral oils in November, 1867.

Distillation had fairly commenced, from a still heated in the usual manner, by a direct fire underneath, and charged with nine hundred gallons of mixed heavy and light oils that had been previously distilled, and which were too heavy for illuminating and too light for lubricating purposes, when it was found that the condenser had partially closed from some accidental cause; and this by the consequent pressure, soon caused leakage at joints about the bottom of the still, over the fire. Continued distillation increased the leakage, so that it was necessary to withdraw the fire gradually from under the still; although the distillation was continued for some time in an attempt to empty the apparatus by operating very slowly. When the fire was removed, and after distillation ceased, two hundred and fifty gallons of light hyro-carbons, had passed over through the condenser. The next day, the oil left in the still, having cooled sufficiently, was removed; and Mr. Merrill was surprised to find it different from anything that had ever been seen

before. It had a bright yellow color; was clear, very nearly odorless, neutral and dense. Further experiments showed this result to have been obtained by the removal of all light odorous hydrocarbons without decomposing either the distillate or the oils remaining in the still, and that this had been accomplished by the moderate fire employed, and its gradual withdrawal.

This mode of operating was immediately applied to other distillations; and, after two months spent in determining the best mode of procedure, Mr. Merrill obtained letters patent for his valuable discovery, from which extracts will be made in a description of the present improved processes of manufacturing petroleum products, at the end of this memoir. This discovery consisted, first, in determining that the odor and taste of the heavy distilled oils arise from the presence in them of light and odorous hydro-carbons, formed during the previous and necessarily destructive distillations; and that when they are removed by distilling in a suitable apparatus, with the application of only sufficient heat to remove them, without decomposing or cracking the oils in the still, the latter are left nearly odorless. And, secondly, in perfecting the means for effecting this removal of the odorous bodies. The introduction of steam from an open pipe to the body of the apparatus during this distillation, aids greatly in effecting the separation as it lifts the light vapors out mechanically into the condenser; and it also serves to regulate the heat employed for distillation.

Thus, by extraordinary means, true fractional distillation of the heavy mixed oils is effected; and Mr. Merrill says: "I believe it is impossible to prevent the cracking or decomposition of these hydrocarbon oils, except by keeping them in the still, at temperatures below their boiling point.

Many hundred thousand gallons of this neutral heavy hydro-carbon oil, which has frequently perplexed the most expert judges and dealers in oils, have been made by Mr. Merrill. It is almost odorless and tasteless, and cannot be easily distinguished when mixed with one-fifth part of its volume of the best bleached animal, sperm or other fat oil, as an examination of this specimen will assure you. No better estimate of its valuable qualities can be given than the statement that, in the year 1871, fifty thousand gallons of this oil were sent to England alone, where it was used for lubricating spindles, oiling wood and other purposes. Another important substance obtained from petroleum is

Paraffine.—This was one of the very first products made at the works in South Boston, in the early days; and it is interesting to know, that while Cuban chapapote bitumen yielded paraffine by distillation, and Albertite gave large quantities if it, the Trinidad bitumen never afforded any of this crystalline mineral wax. Mr. Merrill began to make paraffine from Pennsylvania petroleum in 1859, and since then has, at times, made the enormous quantity of fifty thousand pounds (or twenty-five tons), in one month. It is a product of destructive distillation of this petroleum, and does not exist already formed in the crude oil.

This substance is used principally in candles, also for rendering textile fabrics waterproof, and for many other purposes; as one maker of friction matches in New York has used one hundred thousand pounds, and a manufacturer of chewing gum in Maine seventy thousand pounds, of paraffine in one year.

Mineral Sperm-oil.—The fourth product to which I wish to draw your attention is mineral sperm oil. This is a burning heavy oil made from petroleum; and its valuable properties as a safe illuminating agent are such as to render this product one of very great importance. The following statement of its discovery and characters is given in Mr. Joshua Merrill's own words:

"In the summer of 1869, in connection with Mr. Rufus S. Merrill, I made an important discovery relating to burning the heavy or paraffine oils in lamps for illuminating purposes. Mr. R. S. Merrill is a skillful mechanic, who has devoted himself for several years to perfecting the construction of lamps and burners for hydro-carbon oils. While experimenting upon an apparatus for burning paraffine wax, with a view to increase the light from this beautiful substance over that obtained from common candles—the only form in which paraffine is burned—he one day put some lubricating oil into the lamp, instead of the paraffine wax, and we were both much surprised at the good qualities of the light yielded by it. But, after examining some days, we found this heavy oil to be impracticable as an illuminating material in its present form, and that some modification would be necessary. It occurred to me that if this heavy paraffine oil was passed through a partially destructive distillation, cracking it enough to lessen its viscidity, but not enough to render it volatile, its increased mobility would cause it to ascend the wicks freely, and yet preserve its character as a fixed oil.

"After many trials, I obtained the product now called 'mineral sperm-oil,' which is sufficienly thin to fill the wicks perfectly; but it is so far from being a volatile oil that it is comparatively inodorous, and will not take fire at any temperature below 300 degrees Fahrenheit, or nearly a hundred degrees hotter than boiling water. Flames of considerable size, such as a large ball of wicking-yarn, saturated with oil, and ignited, when plunged beneath the surface of this oil, previously heated to the temperature of boiling water, are extinguished at once. It burns freely in the German student lamps, and with great brilliancy from the 'Dual' burner."

The manufacture of this oil is patented in this country and in Great Britian; and Mr. Merrill estimates the quantity that may be made at least one-quarter of the whole production of petroleum, or about one hundred and sixty thousand gallons of mineral sperm-oil every day—a quantity more than twice that of the whale and sperm oils obtained in the best days of the whale fishery in this country.

The present time, when government authorities and scientific men are so generally cautious against

the "dangers of kerosene," and just as French savans have discovered that certain heavy petroleum oils may be burned in lamps, seem peculiarly opportune for the introduction of this product of American skill and invention—namely, a hydro-carbon, or mixture of hydro-carbons, which seems to fulfill all the requiremnts of an oil to be burned in lamps, yielding a steady, brilliant and safe light. And practical indications of its appreciation may be found in the manufacturer's announcement, that the demands for this mineral sperm-oil is steadily increasing. It is used on ocean steamers plying between the United States and Europe, and also on several railroads.

Manufacture of Petroleum Products.—It only remains for me to give you a brief outline of the manufacture of petroleum products, as conducted at a well-managed establishment in this vicinity.

The crude petroleum is received here from the West in round wooden tanks, one or two of which occupy a railway carriage, as you have undoubtedly observed them on the neighboring railroad; and these are sometimes emptied into bulk-boats, when the works are more easily approached by water. The petroleum is pumped out underground into the iron reservoir tanks that closely resemble gasometers, where any sand and salt that may be present are deposited and removed. The crude oil, drawn from these reservoirs is first pumped into large wrought-iron stills or upright cylinders, incased in wood to prevent loss of heat, which hold about twelve thousand gallons each. These are the naphtha stills, in which the petroleum is heated by steam alone; the distillates being collected by condensers, consisting of iron pipes surrounded with cold water. Only the naphthas, or about fifteen per cent. of the crude oil, are distilled from the large stills; but the four kinds (gasolene, A, B and C naphtha) are collected in different receptacles. Righolene, as stated before, is made by a second distillation of gasolene.

The steamed crude oil remaining in the naphtha stills is pumped from them into smaller stills heated by direct fires underneath, and holding about a thousand gallons each; the whole contents of these are distilled over and condensed, excepting that which passes into the air as uncondensable gas, and the separated carbon. This is the first complete distillation, and it is eminently destructive; the products being separated, by densities, into three grades—No. 1, crude burning oil; No. 2, intermediate oils; and No. 3, crude lubricating oil. Each of these is redistilled by itself in apparatus of the same size and construction as that used for the first distillation, and they all break up again into lighter, intermediate and heavy oils. No. 1 is thoroughly agitated with sulphuric acid and caustic soda successively; by revolving stirrers in large tanks, before its second distillation; and it then yields from the still, eighty per cent. of its volume of finished kerosene and mineral sperm, and nearly twenty per cent. of denser oil. No. 2 is redistilled before treatment with acid and alkali; it yields crude lubricating oil principally. No. 3, the crude lubricating oil, requires more careful manipulation than either of the others. It is first agitated with sulphuric acid, and then distilled with caustic soda present in the still, the product being mostly dense paraffine oil. This is placed in wooden barrels, in ice-houses, where it remains for from seven to ten days; and during this time the paraffine wax crystallizes, so that the masses retain the form of the barrels when they are removed. It is now put into bags made of strong cloth, which are arranged one above another, with sheets of iron between them; and, when submitted to heavy pressure, it yields crude scale-paraffine wax remaining in the bags, and the heavy oil is pressed out. The crude paraffine is refined by repeated solution in naphtha, recrystallizing and pressing until it is perfectly white and pure, ready for sale. The heavy oil is treated by the patent deodorizing process. It is placed in stills heated by fires underneath; and the temperature is slowly and gradually raised, until from twenty to thirty per cent. of the contents of the apparatus is distilled over; it is then allowed to cool in the stills, and when removed, is ready for sale. The hydro-carbons that pass over the condensers during this process have very offensive odors; but the oil remaining in the stills, if the operation has been properly conducted, is free from the characteristic odor of paraffine oil, and has only a slight odor, similar to that of fat oil. Live steam is generally used in the body of the oil during this operation, and the distillation is effected at as low a temperature as possible.

The very last distillates that are obtained from all the destructive distlilation made at the works are highly colored, and known technically as "cokings;" they are accumulated and distilled by themselves, yielding crude lubricating oil principally. After every distillation of petroleum, or the products obtained from it, considerable masses of separated carbon are obtained as residuum; and, as caustic soda is frequently used in the apparatus, it remains in this coke; this is saved, however, by burning the carbon in a properly constructed fireplace; and the ashes lixiviated yield the soda as carbonate. The sulphuric acid that has been agitated with the oils, known technically as "sludge," is carefully saved, and generally sold to makers of biphosphate of lime fertilizers, although some of it has been successfully converted into commercial oil of vitriol by an ingenious process that I need not detain you to describe.



OLD IMPERIAL OIL REFINERY

Oil City, Pa.



ECLIPSE OIL REFINERY

FRANKLIN, PA.

CRUDE OIL REFINERIES.

The first oil refinery erected in the oil regions was built by William A. Abbott, James Parker and William Barnsdall, at Titusville, Pa. Work on the refinery was begun on the 6th of November, 1860, and on the 22nd day of January, 1861, the fires were lit and the refining of oil was commenced. The success of this refinery was the beginning of several oil refineries on Oil Creek and in different parts of the United States. As an illustration of the enterprise of oil refining in the United States in a little over ten years, when once a refinery had begun to refine crude oil, a list of the refineries in 1872 is given.

STATISTICS OF CRUDE OIL REFINING—REFINING CAPACITY OF THE UNITED STATES IN 1872.

Statement showing the refineries in the oil region of Pennsylvania, with their respective daily still capacity for crude:

Name	Location	Daily Capacity. Bbls. of 43 Gals.
Porter, Moreland & Co.,	Titusville	1,213
Bennett, Warner & Co.,	"	856
Octave Refining Co.,	"	606
Pickering, Chambers & Co	"	512
Easterly & Davis,	"	496
R. M. & J. W. Jackson,	"	288
M. N. Allen,	"	251
Decker & Co.,	"	190
A. H. Lee,	"	185
J. A. Scott,	"	139
Cadam & Donohue,	"	68
John Johnson & Co.,	Miller Farm,	308
Dudley & Co.,	"	250
A. R. Williams,	'	243
Z. Chandler,	Gregg Switch,	187
H. De Zebla,	Pioneer,	127
Patterson Refinery,	Petroleum Centre	292
Herman, Cornell & Co.,	"	198
Bartlet t& Newton,	"	47
Doe & Frazer,	Rouseville	117
Producers Oil Works,	"	100
Levi Kerr,	Tarr Farm,	227
Imperial Refining Co.,	Oil City,	1,385
Standard Oil Co.,	"	418
Economy Refining Co.,	"	321
Solar Oil Works,	Oleopolis,	171
L. D. Galligan,	Tidioute,	36
	Total daily capacity,	9,231

REFINING CAPACITY OF NEW YORK.

Statement showing the daily refining capacity of the city of New York and vicinity in 1872.

Works and Location	Owned or Run By	Daily Capacity. Bbls. of 43 Gals.
Kings Co. Oil Works, Newtown Creek, Green Point. L. I	Sloan & Fleming, 159 Front St., N. Y.	1,700
Pratt's Oil Works, Brooklyn, E. D	Chas. Pratt & Co., 103 Fulton St., N. Y.	1,500
Empire Oil Work, Hunter's Point, East River, Long Island City, Queens Co. Oil Works, Newton Creek, Long Island City, Franklin Oil Works, Newtown Creek, Brooklyn. E. D.,	R. W. Burke, 181 Pearl St., New York	1,500
Olophine Oil Co., Green Point, L. I	Olophine Oil Co., 322 Broadway, N. Y.	1,000
Brooklyn Oil Works, Green Point, Brooklyn, E. D	Wm. A. Byers, 181 Pearl St., N. Y.	600
Central Oil Works, 66th St., N. River	Lombard, Ayres & Co., 58 Pine St., N. Y.	600
Hudson River Oil Works, Bull's Ferry, N. J	I. H. Wickes, 120 Maiden Lane, N.Y	400
Locust Hill Oil Works, Newtown Creek, Long Island City	I. Donald & Co., 124 Maiden Lane, N.Y	140
Union Oil Works, Brooklyn, E. D	T. Meyer, 126 Maiden Lane, N.Y	105
Washington Oil Works, Newtown Creek, Brooklyn, E. D	Thomas McGoey, 143 Maiden Lane, N.Y	215
Wallabout Oil Works, Brooklyn, E. D	S. Jenney & Son, Kent av., foot of Rush St., Brooklyn, E. D.	280
Vesta Oil Works, Gowanus Creek, Brooklyn	W. & G F. Gregory, 125 Maiden Lane, New York	200
	Geo. Summer I., Cor. Warren and 1st St., Jersey City	175
Peerless Works, Brooklyn, S. D., Foot of 25th Street	Denslow & Bosh, 128 Maiden Lane, New York	175
Long Island Oil Works, Long Island City	Long Island Oil Co., 140 Pearl St., N. Y.	1,200
	Total daily capacity, bbls.	9,790

REFINING CAPACITY OF PITTSBURG, PA.

Statement showing the daily refining capacity in Pittsburg and vicinity in 1872.

Name of Refinery	Owner	Capacity per day
Central	Central Refining Co.	1,165
Penn	H. S. A. Stewart	130
Standard	Standard Oil Co.,	650
Iron City	H. S. A. Stewart	75
Vesta	R. S. Waring	335
Nat'l Ref. & Storing Co.	Nat'l. Ref. & Storing Co.	330
Keystone	P. Weisenberger	65
Petrolite	Wormsen, Myers & Co.,	130
Cosmos	Braun & Wagner	260
Lily	Brooks, Ballantine & Co.	100
Citizens' Co	Citizens' Oil Co.,	400
Riverside	Elkins, Bly & Co.,	110
Fairview	Alonold Hertz	110
American	L. Irwin & Co.	330
Crystal	Livingston Bros.,	200
Brilliant	Lockhart, Frew & Co.,	670
Model	Model Refining Co.,	260
Liberty	J. A. McKee & Sons,	200
Star	Ralston & Waring	130
Empire	D. P. Reighard	60
Nonpariel	Warden & Oxenerd	80
Hutchinson	Hutchinson Oil Ref. Co.	200
		6,090

REFINING CAPACITY OF PHILADELPHIA, PA.

Statement showing the Refineries in Philadelphia and vicinity, with their respective daily Still Capacity in 1872.

Name and Location of Works	Owned or Run By	Daily Capacity, Bbls. of 43 Gals.
Atlantic Point Breese	Warden, Frew & Co.,	665
Point Breeze Point Breeze	Stewart, Matthews & Co.	266
Franklin, Gibson Point	J. L. Stewart,	200
Phoenix, Gibson Point	M. Lloyd	133
Harkness Gibson Point	N. W. Harkness,	100
Monumental, Hestonville	Taber, Harbut & Co.,	100
Belmont, Hestonville	W. L. Elkins	165
Reliance, Hestonville	W. D. Heston,	100
Excelsior, Hestonville	W. King,	100
Greenwich Refinery, Greenwich	Greenwich Oil Co.,	100
Stephen Carr, City	Stephen Carr,	66
Victoria, City	Carson & Conlin	66
		2,061

REFINING CAPACITY OF CLEVELAND, OHIO.

Statement showing the refining capacity of Cleveland, Ohio, and vicinity in 1872.

NAME OF OWNER	LOCATION	NUMBER BBLS. CRUDE. DAILY CAPACITY
Standard Oil Company	Cleveland	10,000 Barrels
Hanna, Chapin & Co.	"	732, 40 Gall. to Bbl.
Schofield, Squire & Teagle	"	675, 42 " "
Bishop & Heisel	"	300, " " "
W. H. Doan	"	825, " " "
Corrigan & Co	"	200, " " "

REFINING CAPACITY OF BALTIMORE, MD.

Statement showing the refineries of Baltimore, Md., with their respective daily Still Capacity in 1872.

Name of Owners	Name of Refinery	Daily Capacity. Bbls. of 43 Gals.
Merritt, Jones & Co.	Canton	650
Sylvia C. Hunt	Monumental	90
Robert Read	Baltimore	30
Christopher & Co.	Standard	35
Carswell & Son	Crystal	133
Newbold & Son	Belvidere	60
C. West & Son	Rising Sun	40
Brown, Hamill & Co.	Patapsco	60
		1,098

REFINING CAPACITY OF ERIE, PA.

Statement showing the refineries of Erie, Pa., with their respective daily Still Capacity, in 1872.

Name of Owners	Location	Daily Capacity, Bbls. of 43 Gals.
Ira G. Hatch	Near Philadelpia & Erie R. R. on Tenth St.	305
Brown Bros.	Sixth Street	430
O. C. Thayer & Co.	Mill Creek	155
Wallace & Vaughn	Mill Creek	160
M. V. Dawson	Mill Creek	98
I. W. Watkins	Mill Creek	20
		1,168

BOSTON, MASS.

The Crude Refining Capacity of Boston, Mass., and vicinity in 1872 was estimated at 3,500 barrels per day.

BUFFALO, N. Y.

The Crude Oil Refining Capacity in 1872.

The Star Oil Works, owned and operated by Thayer & Riddell, No. 385 Hamburg St., Buffalo, has a Still Capacity of nearly two hundred barrels per day.

Dudley & Co., Buffalo, have a refining Still Capacity of 251 barrels per day.

CRUDE OIL CAPACITY OF PORTLAND, ME., IN 1872—PORTLAND OIL WORKS.

Portland had one refinery, originally built and used for the manufacture of coal oil, with a capacity for working ten thousand tons of coal annually. It was one of the best and most perfect coal oil works in the United States, and was among the most extensive. It was the last to give up the manufacture of coal oil. The still capacity of these works was 350 barrels of crude oil daily. WM. ATWOOD, Supt...

JAMESTOWN, N. Y., IN 1872—MARVIN & CO. OIL WORKS.

This was a small refining locality, the works being owned by Messrs. Marvin & Co. Their still capacity was about fifty barrels per day.

THE OIL REFINERIES OF THE PRESENT DAY.

They are much larger and have a much larger refining capacity than those used in the early days. The Bayonne refinery at Bayonne, New Jersey, owned by the Standard Oil Company, is the largest in the world. It covers over five hundred acres of ground, has a deep-water harbor, with crude and export oil docks, with deep-water outlet to New York bay, which enables the large tank steamers and other vessels to land at its docks and load or unload their cargoes of crude or refined oil for all ports in the world. This refinery is the seaboard terminal for the Standard Oil Company's seaboard pipe lines. This refinery is divided into two yards, as follows: Old yard, 60 stills, 25 feet long and 14 feet high; 18 sweeping stills 40 feet long, 19 tar stills, 10 steam stills; 1 borax and acid house. New yard, 40 sweeping stills, 40 feet long; 24 new tar stills, 8 large new tar stills, 10 large steam stills, 8 large reducing stills, 1 cooper shop, with a capacity of 20,000 barrels a day; 1 tin shop for making tin oil cans, 1 pump station for loading and unloading tank steamers, and other vessels; and one office building.

In the back part of both yards are 200 iron tanks, 90 feet in diameter and 35 feet high, with a capacity of 35,000 barrels each. The yards are surrounded by a brick wall six feet high. This refinery has the finest fire equipment in the world. All the tanks, stills and buildings are connected with water, steam and acid fire extinguishers. The capacity of the refinery is over 20,000 barrels of oil a day. The main general office of this refinery is in the Standard Oil building, 26 Broadway, New York. The refinery can be seen across New York bay from the upper floors of the Standard building in New York. The officers of the refinery are as follows:

James Smith, L. D. Morrison and J. P. Krebs, Committee; J. E. Eggleston, Superintendent of Refinery; Edward Johnson, Master Mechanic; Asa Hunter, Chief Engineer.

The Standard Oil refineries at the present time are: Thompson & Bedford, Constable Hook, N. J.; Pratt Refinery, Green Point, Long Island; Sone & Fleming Refinery, South Brooklyn, N. Y.; Atlantic Refinery, Philadelphia and Pittsburg, Pa.; Acme Refinery, Olean, N. Y.; Galena-Signal Oil Works, Franklin, Pa.; Eclipse Refinery, Franklin, Pa.; Vacuum Oil Company, Rochester, N. Y.; Kings County Oil Refinery, Constable Hook, N. J.; Eagle Oil Works, Constable Hook, N. J.; Star Refinery, Buffalo, N. Y.; Standard Oil Refinery, Point Breeze, Philadelphia, Pa.; Queens County Oil Works, Long Island City, N. Y.; Camden Consolidated Refinery, Baltimore, Md.; Peerless Manufacturing Company, Louisville, Ky.; Chess, Carley & Co., Louisville, Ky.; Standard Oil Company of Ohio, Refineries Nos. 1 and 2, Cleveland, O.; Solar Refinery, Lima, O.; Maumee Refinery, Toledo, O.; Whiting Refinery, Whiting, Ind.; Prairie Oil Refinery, Neodesha, Kan.; Kansas Refinery, Kansas City, Kan.; Consolidated Refinery, Florence, Col.; Waters-Pierce Oil Company, St. Louis, Mo.; Camden-Standard Refinery, Parkersburg, W. Va.; Security Refinery, Port Arthur, Tex.; Lone Star Refinery, Corsicana, Tex.; Pacific Coast Refinery, Point Richmond, Cal.

The Acme Refinery, of which John D. Archbold is president, is the general head refinery, with all the Standard Oil Company's branch refineries combined, and each refinery has a territory to cover, and no two refineries of the Standard Oil Company will sell or ship oil into one and the same territory. This territory is supplied by the Atlantic Refinery of Pittsburg, Pa.

Following are the leading independent oil refineries at the present day:

Pure Oil Refinery, Marcus Hook, Philadelphia, Pa.; Emery Manufacturing Company Oil Refinery, Bradford, Pa.; Wilberine Oil Works, Warren, Pa.; Corn planter Refining Company, Warren, Pa.; Crew, Levick & Co. Oil Refinery, Warren, Pa.; Seneca Oil Works, Warren, Pa.; United Refining Company, Warren, Pa.; Conewango Refining Company, Warren, Pa.; Superior Oil Works, Warren, Pa.; Warren Refining Company, Warren, Pa.; Levi Smith Refining Company, Clarendon, Pa.; Union Petroleum Company, Clarendon, Pa.; Empire Oil Works, Oil City, Pa.; Penn Refining Company, Ltd., Oil City, Pa.; Crystal Oil Works, Oil City, Pa.; Germania Refining Company, Oil City, Pa.; Independent Refining Company, Ltd., Oil City, Pa.; Pennsylvania Paraffine Oil Works, Titusville, Pa.; Titusville Oil Works, Titusville, Pa.; American Oil Works, Ltd., Titusville, Pa.; Emlenton Refining Company, Emlenton, Pa.; Sun Oil Company Refinery, Toledo, O.; The Paragon Refining Company, Toledo, O.; Imperial Oil Works, Marietta, O.; The Merchants' Refining Company, Buffalo, N. Y.; Beaver Refinery, Washington, Pa.; Freedom Oil Works, Freedom, Pa.; Pittsburg Refining Company, Coraopolis, Pa.; Union Petroleum Company, Philadelphia, Pa.; Miller's Oil Refining Works, Allegheny,

Pa.; The Island Petroleum Company, Pittsburg, Pa.; Waverly Oil Works, Pittsburg, Pa.; Great Southern Refinery, Port Arthur, Tex.; Burt Refinery, Port Arthur, Tex.; Gulf Refining Company, Port Arthur, Tex.; Higgins Refining Company, Port Arthur, Tex.; New Franklin Refinery, Los Angeles, Cal.; The Union Refinery, Bakersfield, Cal.; Sunset Refinery, Sunset, Cal.

The competition the producers and refiners of American oil have to contend with is the foreign crude and refined oils and a duty or tariff levied on all American oils in foreign countries, as also on all kinds of coal, wood and coke, electric light and manufactured gas, cotton-seed oil, lard oil and tallow, peanut and fish oils.

Both the Standard Oil and independent oil refiners have a regular line of tank steamers to deliver the refined export oil to all ports of the foreign countries. A great deal of the oil is delivered in barrels and tin cans of five American gallons, or four imperial gallons, to the can. The American oil is the safest, cheapest and makes the best light of any oil in the world. The money received from the export oil from the foreign countries amounts to about $75,000,000 a year. This money goes to the American oil producer and refiner and American laborers. The Standard Oil Company, when they first began to refine oil, had only one grade of refined oil. Their trade-mark was Standard Oil. That grade was 120 flash test,. All of their barrels at the beginning were painted blue, with white heads. The same style and color is used at the present day.

Names of refined oils refined by the Standard Oil Company, Ohio State test: Prime White, Water White, Red Star, Eocene, Crystal Light, Hyperion, Diamond White, 150°; Pratt's Astral, 150°; Silver Light, 120°; Eastern, Elain, Pearl.

LIST OF OILS REFINED BY THE ATLANTIC REFINERY. [STANDARD REFINERY.]

Naphtha and Gasoline.

62° Naphtha,	76° "
65° "	86° "
Stove Gasoline,	87° "
72° "	88° "
73° "	90° "

Refined Oils.

110° Prime White,	165° " "
120° Standard White,	Crown Acme,
120° Water White,	Ohio Legal Test, 120°.
150° " "	

Lubricating Oils.

Capitol Cylinder,	Eldorado Engine,
Ruby Capitol Cylinder,	Eldorado Castor,
20th Century Cylinder,	Solar Red Oil,
A Filtered Cylinder,	No. 2 Red Oil,
B Filtered Cylinder,	B Spindle,
D Filtered Cylinder,	Heavy Spindle,
E Filtered Cylinder,	Gravity Spindle,
H Filtered Cylinder,	Dark Neutral,
Dark H Filtered Cylinder,	Venango Neutral,
S Filtered Cylinder,	Yellow Neutral,
T Filtered Cylinder,	White Neutral,
FFF Cylinder,	B Neutral,
Alaska Cylinder,	D Neutral,
Cold Test Cylinder,	Pittsburg Neutral,
A Cold Test Cylinder,	Franklin Neutral,
B Cold Test Cylinder,	Domestic Neutral,
AA Cylinder,	White Rose,
Model Cylinder,	Wool Stock,
Shield Cylinder,	Heavy Wool Stock,
Marine Cylinder,	White Rose Wool,
Viscosity Cylinder,	Llama Wool,
Ebony Cylinder,	Standard Wool,
Steam Refined Cylinder Stock,	Angora Wool,
Summer Lubricating,	Merino Wool,
25-30° Cold Test Lubricating,	Excelsior Wool,
15° Cold Test Lubricating,	Atlantic Red Engine,
Zero Cold Test Lubricating,	Standard Gas Engine,
Slide Oil,	Renown Gas Engine,
Diamond Paraffine,	Marine Engine,
Zone Paraffine,	Residuum,
Polar Ice Machine,	Mineral Seal Oil,
Victoria Twine Oil,	Smith's Ferry Oil,
Union Thread Cutting,	Amber Silk Oil,
Mineral Soap Stock,	Straw Oil,
B Soap Stock,	Wax Tailings,
C Soap Stock,	No. 1 Miners,
	No. 2 Miners,
	Torch Oil.

NAMES OF OILS REFINED BY THE PURE OIL COMPANY. [INDEPENDENT OIL REFINERS.]

Sunlight Double Refined, 150°; Headlight, 150 fire test; Diamond Safety, 150°; Silver Star; Prime White, 150°; Water White Oil, 120°; Export Prime White, 120°; Export Oil, 100°, 110°, 120°.

NUMBERS OF ILLUMINATING AND LUBRICATING OILS REFINED BY THE CORNPLANTER REFINING CO. [INDEPENDENT REFINERY, WARREN, PA.]

The Cornplanter Refinery uses numbers instead of names for their oils.

Gasoline, naphtha and illuminating oils:

Cornplanter Gasoline—No. 2015, 74 stove gasoline. Uses: For stoves, automobiles and gas engines.

Cornplanter Deodorized Naphtha—No. 2013, 62-63 degrees. Uses: Paints, varnishes, mechanical purposes.

Cornplanter X Water White Oil—No. 2001, 47-48 gravity; 150 fire test. Uses: Highest grade burning oil, water white in color.

Cornplanter 120 Water White Oil—No. 2004, 48 gravity; 120 fire test. Uses: Water white in color, sold only in States not requiring 150 test.

Cornplanter Export Oil—No. 2008, 45 gravity; 116 fire test. Uses: Sold only for export.

Cornplanter 300 Oil—No. 2002, 38 gravity; 265 flash; 300 fire test. Uses: Railroad coach lamps, torches; also match for mineral seal.

Spindle oils and neutrals:

Cornplanter Neutral — No. 2026 — 34 gravity, 330 flash, 390 fire test, 25 cold test, 70-80 viscosity; a bloomless oil. Uses: For mixing with animal and mineral oils and in the manufacture of wool oils; is a match for S. O. Co.'s No. 2 wool stock.

No. 2096—34 gravity, 330 flash, 390 fire, 25 cold, 70-80 viscosity; not a bloomless oil. Uses: For fast running spindles, sewing machines, separators and other light running machinery, cordage or rope oil.

No. 2111—34½ gravity, 330 flash, 390 fire, 25 cold, 80 viscosity. Match for S. O. Co.'s White Rose.

No. 2341—35 gravity, 320 flash, 390 fire, 25 cold, 75 viscosity. Uses: Spindles, looms, sewing machines.

No. 2011—32 gravity, 400 flash, 450 fire, 25 cold, 155-160 viscosity; white, high-grade, viscous. Uses: Spindle and loom oil.

No. 2023—31.8 gravity, 400 flash, 450 fire, 25 cold, 155-160 viscosity. Same as 2011 excepting the color, which is darker.

No. 2½—31.6 gravity, 400 flash, 450 fire, 25 cold, 160 viscosity. A match for Manchester Spindle.

No. 2030—31.6 gravity, 400 flash, 450 fire, 25 cold, 155-160 viscosity. Pale spindle, darker in color than 2023. A match for S. O. Co.'s Atlantic No. 1 filtered.

No. 2034—31.5 gravity, 400 flash, 450 fire, 25 cold, 160 viscosity. Uses: Spindle, machine, gas engine, dynamo, separator. A match for S. O. Co.'s No. 2 Eagle.

No. 2037—Same as 2034, excepting that it is darker in color. Uses: Same as 2034, and also used for leather oil and transformer oil.

Wool stock:

Cornplanter Wool — No. 2212 — 32.5 gravity, 375 flash, 425 fire, 25 cold, 140 viscosity. A debloomed red wool stock. Also used for leather oil.

No. 2396—32.4 gravity, 390 flash, 440 fire, 25 cold, 140 viscosity. Lighter in color than 2212. A match for Eclipse Wool Stock.

Dynamo and engine oils:

Cornplanter Dynamo—No. 2204—30.5 gravity, 415 flash, 470 fire, 25 cold, 190 viscosity. Highest grade dynamo oil, sun debloomed. Uses: Suitable for the heaviest work on dynamos and marine engines. A match for Arctic Engine.

Cornplanter Engine—No. 2202—31 gravity, 410 flash, 465 fire, 30 cold, 200 viscosity. Matches No. 2 or 26 Red and Atlantic Red.

No. 2345—29 gravity, 420 flash, 480 fire, 30 cold, 350 viscosity. Uses: Adapted for work on the heaviest dynamos and engines. Matches Eagle Red and Solar Red.

No. 2193—30.5 gravity, 410 flash, 465 fire, 25 cold, 180 viscosity. Pale Engine same as Renown Engine.

Cylinder oils:

Filtered—No. 2018—29 gravity, 450 flash, 500 fire, 80 cold, 90 at 212 viscosity. Amber color.

No. 2025—29 gravity, 450 flash, 500 fire, 80 cold, 90 viscosity. Extra light in color.

No. 2075—28 gravity, 500 flash, 550 fire, 75 cold, 120 viscosity. Light in color; match for Cosmos.

No. 2027 or 2078—Same specifications, excepting amber color.

No. 2080—Same specifications, excepting dark in color; match for Continental.

No. 2036—27 gravity, 540 flash, 600 fire, 75 cold, 140 viscosity. Extra light in color.

No. 2094—Same specifications; amber color.

No. 2033—Same specifications; dark color; match for Economic.

No. 2106—26¼ gravity, 555 flash, 625 fire, 55 cold, 165 viscosity. Dark color; matches Dark XXX Valve.

No. 2146—26¼ gravity, 555 flash, 625 fire, 55 cold, 165 viscosity. Amber color.

No. 2340—27 gravity, 550 flash, 610 fire, 40 cold, 150 viscosity. Match for F. F. F. and Valvoline.

No. 2343—Same; amber in color.

Unfiltered stocks:

No. 2017—26 gravity, 540 flash, 600 fire, 30 cold, 140 viscosity. Match for S. O. Co.'s "A" and Capitol.

No. 2102—25½ gravity, 585 flash, 650 fire, 30 cold, 200 viscosity. Same as 600 W.

2159—25 gravity, 600 flash, 660 fire, 30 cold, 230 viscosity. Matches Locomotive Cylinder.

No. 2466—23.8 gravity, 630 flash, 700 fire, 40 cold, 270 viscosity.

No. 2421 matches Galena Engine.

No. 2421½ matches Galena Car.

No. 2503 matches Galena Coach.

No. 2502 matches Galena Perfection Valve.

Castor machine oil:

2041—No. 1 Castor Machine. Uses: Axle oil, harvest oil and slow running machinery. A match for XXXX Castor.

No. 2051—No. 2 Castor Machine. Uses: Harvester oil, journal oil, fast running machinery. Lighter in body than 2041; match for Eldorado Castor.

No. 2054—No. 3 Castor Machine. Uses: Harvesters and engine, still lighter in body than 2051; a match for Eldorado Engine.

Cup greases:

Nos. 1, 2, 3, 4, 5—Gear greases; axle greases——

Nos. 1, 2, 3, 4, 5—Gear greases. Axle greases. Motor compound; an extra fine grease, used on U. S. battleships.

NAMES OF ARTICLES MADE FROM OIL.

Rubbing oil for furniture, Ozone Paraffine, Diamond Paraffine, Golden Machinery, White Castile Soap, Marble Castile Soap, Green Castile Soap, Transparent Glycerin Soap, White Toilet Soap, Pink Toilet Soap, Honey Soap, Mothers' Soap, Sibley Soap, Pine Tar Soap, Laundry Chip Soap, Oak Bone Common Soap, Benzone Soap, Paper Mill Felt Soap, Sibley's Screw Cutting and Drilling Compound, Nos. 1 and 2.

MIXING OIL.

The most striking example of chemical preparations of Petroleum is perhaps found in the justly celebrated Galena-Signal oils produced and chemically treated at Franklin, Pa. These oils consist of a lead soap dissolved in the natural Franklin heavy oil. A lead soap is prepared after the ordinary manner, by boiling oxide of lead with a saponifiable oil, and the whole is dissolved in the Franklin Mecca-Belden and West Vir-

ginia lubricating oils. The oils thus prepared have great tenacity and endurance as lubricators, particularly for car axles, for which purpose they are principally used. Mixtures of refined lubricating oils with tallow, sperm, whale and lard oil are used for lubricating. Light lubricating oil, neat's foot oil and castor oil mixed make a fine dressing for leather. Lubricating oil mixed with cotton-seed and lard oil is used for oiling wool. Rape and heavy oil mixed make a fine lubricating oil. Ground graphite mixed with heavy oil makes a fine lubricating oil. Heavy reduced oils are mixed with powdered pyrophyllite. This mineral resembles *talc,* and when powdered is especially soft and greasy to the touch.

Three barrels of cotton-seed oil mixed with two barrels of miners' stock make five barrels of miners' oil Raw linseed oil, mixed in equal parts with linseed refining stock, makes raw linseed oil. Raw linseed oil and Japan dryer heated up to 125° and agitated makes boiled linseed oil. Five gallons of A naphtha and 20 gallons of turpentine mixed make a No. 1 turpentine.

A, B and C naphthas are fluids of different volatilities taken off between gasoline and illuminating oil. They are used in mixing paint, printing ink, dissolving rosin for oilcloth, and as fuel. Natural oil and residuum reduced make lubricating oil to launch boats. Saponifiable oil is used for locomotive driving-wheel boxes.

METHOD OF REFINING CRUDE OIL IN 1894.

REFINED OIL—CRUDE OIL STILLS—CONDENSERS—DISTILLATION OF CRUDE—STEAM STILLS—TREATMENT WITH CHEMICALS AND WASHING—NAPHTHA AND NAPHTHA PRODUCTS—PRODUCTS FROM RESIDUUM—PARAFFINE WAX—REDUCED LUBRICATING OILS.

Refined Oil.—It is no exaggeration to say that two hundred different products are now made from crude petroleum. The limits of such a report as this will not, of course, permit even mention of each further than to outline some general classification. The broadest that can be made is to divide the products into those that result from the distillation, and those that result from the reduction of the crude article. Every product, we think it safe to say, that has been obtained from crude oil, is secured by one or the other, or in some cases, by a combination of both of these processes. By distillation we mean the converting of the crude by heat into vapors and the condensation of those vapors back to a liquid, from which the manufactured article is produced. By reduction we mean the driving out of the crude by heat its lighter portions, leaving the remaining product behind still in liquid form. Products of both classes can be, and usually are, made by the same process; that is ,while heat is converting one part of the crude oil into products by distillation, that is, turning them into vapor for condensation, it is at the same time converting the other part into a product of reduction by driving off the very vapors that make the distillate products. Again: both processes are often resorted to in successive stages of manufacture, to produce certain articles. A distillate product is afterwards reduced, and a reduced product is afterwards distilled; in some instances the processes being repeated several times before the finished goods are secured. This is particularly true of the lighter and the heavier parts resulting from the method of manufacture, aiming to convert the major part of the oil under manipulation into some desired product. These lighter and heavier parts are therefore known to petroleum manufacturers as by-products. As petroleum in its crude state is composed of an almost indefinite number of differently compounded hydro-carbons, that is, combinations of the chemist's elementary substances carbon and hydrogen, varying in volatility; and as the manufactured products are almost countless in number, it will be readilly understood that the methods of manufacture must be many, complicated and delicate. In the early days of the industry, but one product was sought for, and today the staple article of manufacture is that same product secured, however, in many grades. We refer to refined oil. But the possibility of making other valuable products was soon apparent, and each year experience and study in the art have developed almost unlimited extension of the use of petroleum.

The main product of petroleum, refined oil for illuminating purposes, is always the result of distillation. At many large works to-day the crude oil, which is the base of all petroleum products, is received into storage tanks of 30,000 to 35,000 barrels capacity direct from the main pipe-lines. Formerly crude came to the works in barrels, from which it was emptied into troughs and flowed through a seive, to catch solid impurities, into tanks. Some of the less important refineries do not have this direct connection with the pipe-lines, and crude is brought to them in tank cars. These have an outlet valve at the bottom to which hose is connected carrying the oil into a large pipe which conveys it to the tank from which the stills are filled. When the stills are ready to be charged, powerful pumps force the crude oil through large lines into them, as it is important that time should not be wasted in this preliminary work. A careful refiner makes sure that no water is pumped into his stills; for if it is; it must also be evaporated, as well as the oil.

The production of refined oil is the result of four distinct steps.

(1) Fractional distillation (that is the vaporizing and condensing of the oil) in a still heated by fire. (2) Fractional distillation in a still heated by steam. This is really a reducing process so far as the refined oil is concerned. (3) Treating the distillates with chemicals and washing them with water. (4) Settling to make the oil clear and bright for delivery.

Crude Oil Stills.—Many different sizes of stills have been tried, from the primitive cast-iron one of a few barrels capacity of the early days to the huge cheese-box vessels holding 3,000 and 3,500 barrels erected at several works, and many different varieties have been tested—upright cylinders, horizontal cylinders, cheese-boxes of various construction, not to mention the unsuccessful devices for effecting continuous distilla-



GREENLEE & FORST – JAMES MEVEY FARM – LARGEST WHITE SAND OIL WELL IN THE WORLD – McDONALD PA OIL FIELD



JENNINGS, GUFFEY & GALEY FAMOUS JOS. MATHEWS FARM WELL NOBLESTOWN PA.



GAS PUMPS AND TOOL HOUSE GEO. H. MILLER FARM McDONALD PA. OIL FIELD.



FIRST FIFTH SAND WELL DRILLED, SAM'L WEIRICH FARM TAYLORSTOWN PA OIL FIELD.



JAMES MEVEY FARM PUMPING OIL WELLS. McDONALD, PA OIL FIELD.



SPUDDING WELL, McDONALD OIL FIELD.



THE MOST CROOKED STEM EVER FISHED OUT OF A WELL. IUKA, WEST VA



SHOOTING WELL ON OIL CREEK ROUSEVILLE, PA.



TUNNEL OIL FIELD, MOORES JUNCTION OHIO.



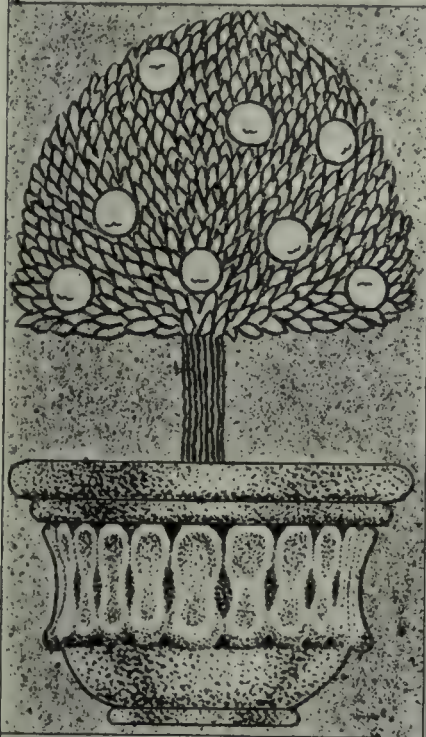
HENDERSON OIL FIELD, WOOD CO. W.VA.



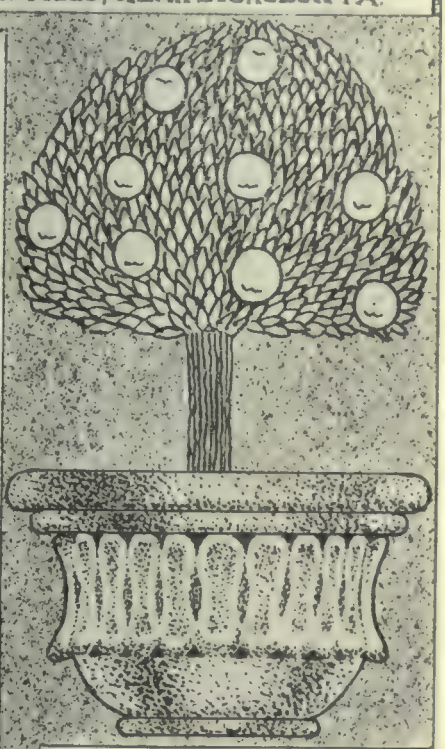
LARGEST OIL WELL IN WEST VIRGINIA
M. COPLEY HEIRS FARM, SAND FORK LEWIS CO.



MEVEY FARM OIL PUMP STATION
McDONALD OIL FIELD, NEAR STURGEON PA.



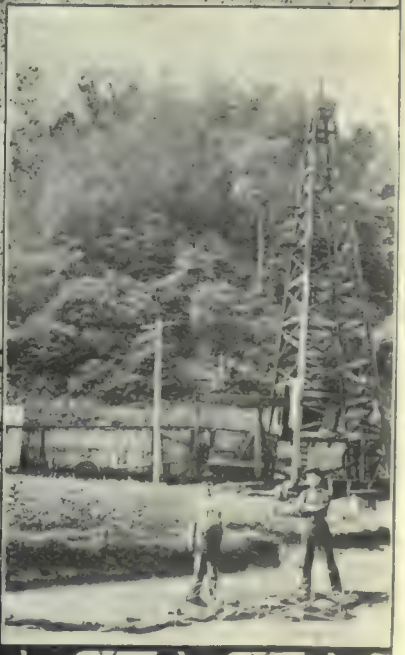




FLAG RAISING AND BASE BALL GAME
AT McDONALD, PA IN THE WORLD
FAMOUS WHITE SAND OIL FIELD.



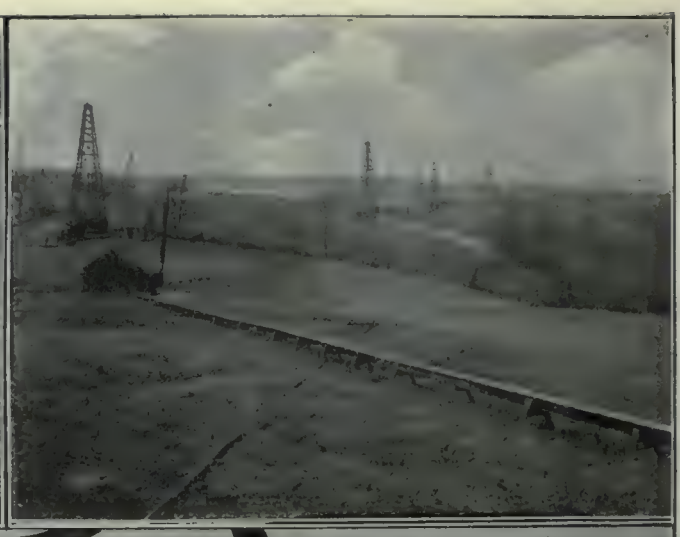
TUBING OIL WELL
STEELS RUN OIL FIELD WEST VA.



PUMPING OIL WELL WITH ELECTRICITY
FOLSOM OIL FIELD, WEST VA.



W.H. RANK BLACKSMITH SHOP FOLSOM, W.VA



OIL FIELD OF McDONALD PA.



MAGGIE McDONALD FLOWING OIL WELL No 1, McDONALD PA.



STANDARD OIL CO'S $2.000.000 FIRE
AT BAYONNE N.J. JULY 4, 5 AND 6" 1900.



REMAINS OF OIL CITY PA.
AFTER THE GREAT OIL CREEK FIRE JUNE 5" 1892.



GEORGE RICE OIL WELL MACKSBURG, O.
OLDEST PRODUCING OIL WELL IN THE WORLD.



FIRST ELECTRIC POWER BUILT TO PUMP OIL
WELLS, FINNEY STA. WASHINGTON CO. PA OIL FIELD



RUNAWAY BULL WHEELS. N.G. COOK FARM
WELL No 4 FOREST OIL CO. McDONALD OIL FIELD.



RUNAWAY BULL WHEELS
ROUSEVILLE, PA. OIL FIELD.



POLECAT WELL No 1.
SISTERSVILLE, W.VA OIL FIELD.



McKEAN CO. OIL FIELD
BRADFORD, PA.



FRANKLIN OIL FIELD
VENANGO CO., PA.

LUBRICATING OIL FIELD NEAR FRANKLIN, PA.



SIDE FLOW OF OIL


McDONALD PA.
CENTER OF THE FAMOUS



FLOWING OIL WELL

(McDonald Oil Field,) McDonald, Pa.



PHILLIPS BROTHERS SCHOOLHOUSE WELL NO. 1.
(THORN CREEK OIL FIELD JUNE, 1884) THORN CREEK, BUTLER CO., PA.



GLADE RUN OIL FIELD
WARREN, PA.

THE GREAT ARMSTRONG WELL



PUMPING OIL WELLS
NEAR DUKE CENTER, PA.



BRADFORD, PA., (1902)



TUNA VALLEY, BRADFORD, PA.

tion. Experience has narrowed the style of stills down to two, their competing merits being a source of much controversy among practical men. These are known as the cylinder and cheesebox still. The former is a simple horizontal steel or wrought iron cylinder twelve and one-half feet or a little more in diameter and thirty feet or a little more in length. A cylinder of this size holds about 1,000 barrels of crude, and is the size generally found at the seaboard refineries. A circular dome about five feet in diameter and four or five feet high is set on the top of the still in the center, as an outlet for the rising vapors; a wrought-iron gooseneck fifteen inches in diameter, conducting them over to the condenser pipe, to be described later. The still rests on brick work which surrounds the lower half, the upper half being left exposed to facilitate the "cracking" or destructive distillation of the oil already explained. A double fire-box is built under the front quarter of the still, but, by having the flue for the exit of the gases of combustion in the rear, the heat is applied to the whole length of the bottom and well up on the sides of the cylinder. Some of the stills have flues running along their sides, with dampers to cut off the heat at certain stages of the run. The advocates of this style of still claim for it cheapness of construction, because of its simplicity, economy in repairs, and the largest amount of work accomplished with a given quantity of fuel.

Cheesebox stills are somewhat more complicated in construction. They consist of a vertical cylinder ten feet or a little more in height and thirty feet or a little more in diameter, of five-sixteenth inch wrought-iron, with a dome shaped top of the same material, and a five sixteenth steel bottom made in a double curve to provide for expansion. The center is supported on a circular pier of brickwork, which serves also for an exit for the gases of combustion through an underground flue to the chimney. From the central pier a number of brick arches are sprung to the circumference. These arches support the still and form the sides for fireboxes, of which there are varying numbers according to the design of the builder. These fireboxes are placed at equal distances from each other on the circumference of the still. A still the size mentioned above holds about 1,200 barrels of crude. The vapors from the distilled oil pass through three pipes into a vapor chest above the top of the still, from which they are conveyed through a large number of three inch pipes over into the condenser. The advocates of this style of construction claim for it the production of a larger yield of refined oil distillates, of lighter gravity and a superior color.

Both the cylinder and the cheesebox stills are provided with man-holes, covered when the still is charged by circular plates held in place by screws and bolts. One manhole is on the top of the still and one near the bottom,on the end in the case of cylinder and side in the case of cheesebox stills. They are opened to cool the still after it has been run off, the upper one admitting men to clean and inspect it, the lower one being convenient for the men to throw out the coke or dirty sediment that has dried on the bottom and sides during the run. The stills are provided with steam pipes of various plans, charging and drawing off pipes, guages, vacuum and pressure valves, and many other devices.

Condensers.—Originally these were copper coils, which were soon supplanted by coils of iron pipes in a tank of water. Coils of pipe are still sometimes used, but the general plan for condensers is to have straight pipe of convenient lengths laid one above another, and connected together by return bends or manifolds in a rectangular box of iron or wood. Sometimes the distillate is carried through the condenser by a number of separate pipes. In other cases all the vapor passes through one continuous pipe. The aim of the different designs is to secure the most perfect condensation of the oil vapors. Any vapor reaching the end of the condenser pipe in the form of gas is taken away to be burned for fuel. The condensed vapor is received at what is known as the running room, where it is watched and tested by the refiner and turned into such one of the several tanks set apart for the different products as, from time to time during the progress of the run, seems best.

Distillation of Crude.—As soon as the stills are filled a gentle fire is started under them, and the more volatile constituents of the crude are driven off into the condensers where they are cooled sufficiently to be liquefied, flowing as liquid from the end of the worm. Some of the very lightest of the naphtha distillates can be condensed only at low temperatures, and then held in liquid form only under pressure. Usually this is not attempted, but the vapor is allowed to escape in gaseous form to be burned for fuel either under the stills or boilers. It is not possible to describe the distillation or "run" in other than very general details, the points of separation of products varying with different grades of crude, with the proportion of the different times using the same crude, and in accordance with the ideas of the most economical method for securing the best results held by different refiners. As the fire under the still is increased in intensity the condensed vapors that appear at the mouth of the worm in what is known as the "running room" grow heavier as the run progresses, and separations or "cuts" are made by the refiner turned the steam into this or that receiving tank as his judgment directs. The points of demarkation between what is known as naphtha and oil distillate or distillate and residuum are, as can be readily understood, purely arbitrary ones. In fact, even after the most careful separation, it is found that the heavy naphtha contains considerable of the oil distillate, and the oil distillate quite a quantity of the heavy naphtha product. Generally the distilllation is fractionated into four parts—a light and heavy naphtha and two separations in the oil distillate, leaving a residuum or tar in the still. In the running of these products the gravity or density of the condensed distillates continues to grow heavier until a point is reached where, in the judgment of the refiner, the color has become so dark that the distillate cannot be treated up to a satisfactory shade in the finished oil. The fires are slackened in order to allow the "cracking," already described, to occur. By this the vapors are decomposed or split up into heavier and lighter ones, the former dropping back into the boiling oil, the latter pass-

ing over the condenser pipe to be reduced to liquid form. During this process of "cracking" considerable quantities of uncondensable or permanent gas are produced and utilized for fuel.

From the different Pennsylvania crudes the range of product is somewhat as follows:

Naphtha . . .	from 8 to 20 per cent.
Refined oils .	from 78 to 70 per cent.
Residuum . .	from 9 to 5 per cent.
Loss, about	5 per cent.

The gravities of naphtha range from 90° to 62°, the gravities of refined oil distillate from 50° to 44°, the gravities of residuum from 25° to 16°.

The yeilds and gravities vary according to the crude run and the products to be secured. There is left on the bottom and sides of the still, after drawing out the liquid residuum, from one to one and a half per cent. of the original charge, in the form of coke or solid deposit. This is thrown out and used for making carbon sticks. The time required to run off a still of the size we have described is from three to four days.

Steam Stills.—The naphtha and oil distillates that have come from the crude stills are next put into a still worked entirely by steam. These stills are either horizontal cylinders or upright cheeseboxes holding about 1,000 barrels each. The distillation in them is effected by means of steam coils run along their bottom and top. Of the refining of crude naphtha in these stills we will speak more specifically later. Distillates for illuminating oils are subject to a reducing, not a distilling process at this stage of manufacture. The aim is simply to drive off the inflammable gases carried over with the heavier product in fractionating the crude, in order that the distillate may be rendered safer for consumption in lamps. The heat of the steam vaporizes the more volatile gases and carries them into a condenser to be liquified the same as distillate from a crude still. The elimination of the lighter parts from the distillate is continued until the body of the distillate in the still will stand the fire test required. By fire test is meant the temperature at which the oil will give off sufficient gas to ignite and burn.

Treatment with Chemicals and Washing.—The refined oil distillate as it comes from the crude stills is impregnated with tarry matter and inflammable gases, imparting a greenish color and an offensive odor. The gases are driven off in the steam still just described. The color and odor of the distillate after it has been steam-stilled are improved by the purifying action of chemicals and a thorough washing with water. The outline given of the method of treatment employed in early times at the Humboldt refinery, in our section describing those works, would serve almost as well for a description of the process employed to-day; except that then the distillate was moved from one tank to another for the several stages of the work, while it now remains in the same vessel throughout the treatment. This is called an agitator—a large vertical cylinder holding from one to two thousand barrels, generally lined with lead. It is built with a conical bottom to facilitate the removal of the objectionable impurities and water, as the treatment progresses. The agitator having been filled with distillate, sulphuric acid is mixed with it, and the distillate and acid are thoroughly agitated by means of an air blast introduced at the base of the conical bottom. When the air blast is shut off, the acid, completely charged with the resinous matter which it has picked up in its contact with the distillate, gradually sinks by its gravity to the bottom, from which it is readily drawn off as sludge without disturbing the purified distillate above. The distillate is then treated in the same way with soda or some other alkali, to neutralize any trace of the acid that may be left in it. The soda is drawn off in the same way as the acid. After these agitations, the distillate is thoroughly washed with water sprayed on the top and allowed to percolate through to the bottom; the number of washings and the manner of applying the water differing somewhat at different works; this remark is true also of the manner of applying the acid and alkali. The sludge is turned over to the acid-restoring factories or to fertilizer works; the former producing fresh acid, and the latter making ammoniated phosphates from it. The treated distillate is now allowed to run down, or is pumped away, into broad shallow tanks called settling pans where it is allowed to stand for any water or other impurities that may still remain in it to slowly settle out, a steam coil at some refineries being used to furnish the necessary heat in cold weather to raise the temperature to the proper point to facilitate this separation. The oil is now bright, clear and clean, ready for delivery.

Naphtha and Naphtha Products—We cannot help but recognize that the number and variety of petroleum products are almost limitless, when we begin to examine into the naptha specialties. Refined oils are of many grades, from the ordinary low test oil of export to the 300° fire test oil used by certain railroads, to or from the standard white or yellow oil color to the beautiful water-white as clear and brilliant as spring water. But the varied grades are quite similar in constitution and are put to practically the same uses. With napthas it is different. The products are unlike and the purposes served by them widely dissimilar. Naphtha as it comes from the crude stills is charged in a still quite like the steam just described for driving out of oil distillates the more gaseous elements. In this the naptha is distilled by steam heat, the same as refined oil distillate, except that in the case of naptha a much larger proportion of the contents of the still is driven out in the form of vapor. The most volatile portions are seldom condensed. We refer to ringoline, so named by Dr. Bigelow, and chymogene, which are gases at ordinary temperatures, are liquified only at low temperatures, and are held as liquids only under pressure. They have a specific gravity of 0.625 and boil at 65° Fahr. They have been used as anæsthetics for surgical operations, really freezing the parts to which they are applied. They also serve as substitutes for ammonia in engines for articificial refrigeration, their evaporation being so rapid that a temperature of 19 degrees below zero Fahrenheit has been obtained.

The next heavier product is known as gasoline, used generally in machines for carburetting air to make illuminating gas for dwellings and factories.

This product is also employed in lamps for street lighting.

Then follows stove naptha, used for heating and cooking in a great variety of stoves especially constructed for this purpose, a trade already of large magnitude and deservedly increasing with remarkable rapidity, winning its own way as an economical and comfortable means of cooking during the extreme heat of our western and southern summers.

A large proportion of the yield next secured is known as gas naphtha, and is delivered to gas works of cities, being now the staple article from which illuminating gas is made.

These grades, and others especially made for the purpose, are used in paints and varnishes, because of the readiness with which they evaporate, and in the manufacture of floor cloths, patent leather, etc.

Many of the naphtha products have to be treated with chemicals to deodorize them. This is done in an agitator similar to that employed for treating refined oil distillate, but care has to be exercised to avoid large losses by the evaporation of the more volatile constituents when the liquid is agitated. It was, therefore, for some time the practice to effect this agitation by some mechanical contrivance in the way of a vertical revolving shaft fitted with arms, but now an air blast is used as in the case of refined oil. Additional distillation and other manipulations are also needed to finish some of the products designed for particularly delicate uses.

Products from Residuum.—Naphtha is the by-product lighter than refined oil produced in its manufacture. Residuum is the corresponding heavier product. It is the residue of the crude left in the still after the vapors making naphtha and refined oil distillates have been driven out. A by-product at the refinery, it becomes a crude product, or base of manufacture, when transferred to the paraffine works. The residuum is put into stills much like those used for crude petroleum, except that they are smaller and as the fire used is much hotter and the contained liquid heavier, they are built stronger. The charge is distilled to dryness, leaving a thick layer of coke or porous carbon in the bottom, of considerable value for the manufacture of carbon points for electric light lamps, for fuel and for many other purposes.

The distillation of residuum for the manufacture of oils and waxes is an industry by itself, requiring perhaps more skill and the use of much more complicated apparatus than the production of refined oil from crude. Tar stills are often provided with a preliminary condenser in the form of cast or wrought iron eight or ten inch pipe suspended above the still or condenser box in the air, the temperature of the atmosphere being sufficient to liquefy a considerable portion of the vapors. These air condensers are provided with proper outlets to draw off the condensed oil, which, of course, is the heavier part of the vapors, the rest of the vapor passing into a condenser, similar to a refined oil condenser, immersed in water. The first part of the distillate run from tar is generally found to be sufficiently light in gravity to be sold for gas-making purposes, or to go back to the refinery to be re-run for the production of refined oil the same as crude. After this is run off, paraffine oil distillate steadily pours forth from the end of the condenser worm, increasing in gravity and deepening in color until the still is empty. This distillate passes through a treating process much like that employed for refined oil and naphtha, except that it is more severe as the product is so much heavier, requiring longer time, more chemicals and greater care. From this point the manipulation is in the hands of the producer of wax, as the production of the multiform paraffine lubricating oils is the result of methods used to secure the wax. The work is so distinctive and the products so unique that it seems best to consider this subject in a section by itself.

Paraffine Wax.—Fossil paraffine or Ozokerite or "earth wax" has been found for many centuries in enormous quantities in different parts of Europe, but particularly Galatia. It was mined the same as other mineral deposits, purified and made into candles. Peckham tells us that in 1875, there were 22,000 tons taken from the foot hills of the northern slopes of the Carpathian mountains in Galatia and certain mines of Moldavia. Its name was given it by the chemist Carl Reichenbach, who discovered in 1830, that it was the result of the distillation of several organic bodies at high temperatures. He named it paraffine because of its remarkable resistance to chemical action, the literal meaning of the word being "little, or too little affinity." As found in the natural state in these European fields, it appears to be a mass of brown, greenish or yellow scales, which when softened can be molded like beeswax. As made from petroleum, it is in the form of a translucent crystal, of a light yellow to bluish white color, according to the grade of distillate from which it is made and the chemical treatment to which it has been subjected.

It is of interest to find that paraffine was a product of commercial importance long before petroleum oils were manufactured. Crew quotes at length from Prof. F. H. Storer's reference to patents secured by the French chemist Selligue, in 1839 and 1845. We will simply enumerate the products he described as made from bituminous shale, to show how long before the beginning of the petroleum industry, methods almost identical with those that are now so generally employed were known and tried. He used both sulphuric acid and soda for treatment and employed superheated steam in manufacture. The products of his distillation were:

1. A white, almost odorless, very limpid mineral oil that could be used for illuminating purposes in suitable lamps.
2. A light lemon-colored oil, perfectly limpid, almost odorless, that could be burned in ordinary lamps having an elevated reservoir, and, when mixed with animal or vegetable oil, did not easily congeal when subjected to cold.
3. A fat mineral oil containing a little paraffine and peculiarly adapted to lubricating machinery.
4. Red coloring matter extracted from the three oils just mentioned.

5. White crystalline paraffine, which needed but little treatment to be fit for making candles.
6. Grease for lubricating machinery.
7. Black pitch for preserving metals, woods, etc.
8. An alkaline soap.
9. Sulphate of ammonia.
10. Manure from the coke.
11. Sulphate of alumina from the coke.

It is also interesting to remember that the valuable paraffine products extracted from petroleum were not found as the result of a search for them, but in an effort to remove from paraffine lubricating oils an element that made them gum up the machinery on which they were used. Samuel Downer, in his experiments in this direction, chilled the oil until it solidified and then pressed it, the solid that was eliminated being wax.

The practice today is to slowly chill the heavy oil coming from the distillation of tar by means of a solution of sodic, or magnesic, chloride, brought to the required temperature by use of an ammonia refrigerating apparatus. The semi-solid mass is then subjected to hydraulic pressure at a temperature of from 30° to 40°. The cakes remaining after pressing out the oil from the wax are then melted and the wax allowed to again crystalize, to be subjected to a much greater pressure at a higher temperature, the aim being to expel as much of the oil as possible. The absence of the wax from the expressed oil gives it what is called a good "cold test," that is, the quality of withstanding a considerable degree of cold without developing paraffine crystals to clog the machinery upon which it may be used as a lubricant. The absence of the oil from the wax makes it dry instead of greasy when put to its various uses. The temperature to which the distillate is chilled before it is pressed determines what is known as the "melting point" of the wax, that is, the temperature at which it liquefies.

For many purposes, particularly for the manufacture of the finer grades of candles, wax that has undergone even the several purifying processes already described has to be still further freed from oil. This is done by washing it with naphtha or heating it almost to the point of melting, to drain the oil out of it, and then chilling it once more after a slight chemical treatment. In this way a most beautiful, hard, colorless article is secured, which is practically pure crystalline paraffine. It is put to a large number of uses, but its greatest consumption is in the manufacture of candles, where it is gradually displacing all other materials.

Reduced Lubricating Oils.—The paraffine oils just described are the result of the distillation of the residuum or reduced product left behind in the still when distilling crude petroleum. Other lubricating oils, having different characteristics from those of paraffine oils, and therefore better adapted to certain uses, are made more directly from the crude by a reducing process. The lighter elements in the crude are driven off, generally with great rapidity, their quality being ignored in the effort to obtain a proper residue in the still. At some works vacuum stills are employed for this purpose, that is, stills built sufficiently strong to admit of their standing a partial vacuum put upon them by the aid of a pump during the run to accelerate the withdrawal of the vapors liberated from the crude by the heat. A refinery making the reduced products is generally known as a lubricating oil works. The student of the methods at such factories finds himself in a labyrinth of processes and surrounded by multiform products. The extremes of refined oils and of waxes are touched, while between lies a wilderness of products of all kinds designed to meet the varied tastes, whims or needs of consumers. Some of the oils are mixed with the pressed distillate obtained in animal or vegetable oils, and some are purified or decolorized by filtration through animal charcoal Each process is a separate art. And each process has devoted to it intricate and expensive machinery, quite beyond our limits, in such a report as this, to describe.

The advent of petroleum as a lubricant was almost as important as its advent as an illuminant. Its cheapness is reflected in the reduced costs of many lines of manufacture, where the friction of whirling machinery has to be overcome; not to mention its almost exclusive use for the lubrication of the rolling stock of railroads. Improvements in manufacture and more accurate methods of testing have removed the objections offered to the first products put on the market, namely, disagreeable odor and danger from fire, either because the oils threw off inflammable vapors or themselves ignited in spontaneous combustion when heated by friction.

HOW CRUDE OIL IS REFINED AT THE PRESENT DAY.

Not fewer than three hundred different useful products are obtained from petroleum-crude oil, chiefly by distillation. Most of the lubricating oils are prepared from the heavier natural oil, some of which, indeed, comes from the earth in condition for immediate use. The lighter crude oils are those which furnish most of the illuminating media. The distilling apparatus consists of an iron cylinder, or a "cheesebox" tank, into which at the largest refineries the crude oil is delivered direct from the pipe-line. Heat is communicated by coils of steel pipe within the still; the vapors pass out of the cylinder through a coil of wrought-iron pipe immersed in cold water, and are thus condensed. The lightest oils—the naphthas—pass over at a low temperature and are allowed to run into a receiver until a certain degree of specific gravity has been reached, which depends upon the kind of kerosene to be obtained; then the heat is increased and the product, which is illuminating or lamp oil, is directed into a second receiver, while the black, pasty substance left behind is the coke pitch or axle grease residuum. The uncondensable gas is led back to the furnaces and used as fuel. The naphtha contains gasoline, three grades of benzine, and much low-grade kerosene, which are separated from one another by redistillation. The illuminating oils pass from the stills to tanks called "agitators," where they are thor-

oughly treated with sulphuric acid, or oil of vitriol. Under the influence of a strong blast of air, which stirs the oil violently and gives the name to the apparatus, the acid attacks certain substances present in the oil and is itself partly decomposed, giving off sulphurous acid, a strong bleaching agent, and borax is much used for bleaching the oil.

After forty-five minutes or more of agitation with the acid and borax the contents of the tanks are allowed to become quiet. A wonderful change has taken place; the straw-colored, ill-odored oil is now a brilliant, water-white, slightly fluorescent liquid, with very little odor, underneath which is found the black sludge acid, containing the impurities of the oil. The sludge acid is drawn off again into the tanks provided for it, the kerosene is again agitated with sulphuric acid, and then thoroughly washed with water, first by percolation and then by agitation with air, after this water has been withdrawn. The agitation is repeated with caustic soda, and finally water is again used to remove the soda. The kerosene is then removed to storage tanks, or to tank cars or barrels, for immediate distribution; or it is sealed in tin cans for export

On an average, seventy barrels of illuminating oil are produced from a hundred barrels of high-grade Pennsylvania, Ohio or West Virginia crude oil. At least a hundred varieties of lamp oil are produced by the Standard Oil Company, mainly to provide high-price and low-price oils to conform to the laws of the different states. All of these would be called indiscriminately "kerosene" by the general public, but they are very different in appearance and quality, and as to safety in use. Only the best grades of kerosene are popular in the United States, and practically all the cheaper yellowish oils are sent to Europe, where the element of first cost to the consumer is of more importance. The coke pitch, petroleum tar, or residuum, as it is variously styled, forms a very important part of Pennsylvania, Ohio and West Virginia crude oil petroleum, worth almost in dollars and cents as much as all the other products put together, though it forms but ten per cent of the whole. It is redistilled, yielding a light oil which is used as fuel, and the heavy oil, which requires further treatment.

This "heavy distillate" is known as paraffine oil. When it is subjected to cold and pressure crystalline paraffine wax separates from it, leaving an oil from which many of the best lubricants are made, such as sewing machine oil, bicycle oil, jewelers' oil, and oils made to grease any and all kinds of fine machinery. Paraffine wax is one of the most valuable of all the products of petroleum, and is used for more purposes than any other product. It is sold as "crude," "semi-refined" or "refined." Probably most of this is consumed in the manufacture of chewing gum, wax for the ball room floor, and wax for sealing fruit cans; candles, parlor matches, toilet soap and wax tapers occupying second place. The final residue left in the still is "tar still-coke," the purest form of artificially prepared carbon, used in the manufacture of electric light pencils, salves and ointments, hair oil, pomade, vaseline, cosmoline, petrolatum, or petroleum jelly. All these names denote practically one and the same thing—amorphous paraffine wax widely used by pharmacists and in the arts. The methods of preparing it are kept more or less secret, but they depend upon the fact that when the residuum obtained by evaporating petroleum in a vacuum is filtered through bone-black, the result is a brownish-yellow substance which is not affected by acids, is almost free from odor and is semi-solid at ordinary temperatures. Naphtha and gasoline are used as a fuel for naphtha launches and gasoline stoves, circus shows and street lights. Naphtha, gasoline and benzine are used to remove grease and other stains, and for the manufacture of laundry soap.

THE FORTUNES THAT ARE INVESTED IN THE PRODUCING AND REFINING OF PETROLEUM-CRUDE OIL AND ITS BY-PRODUCTS.

In this history the reader has been given the history of how petroleum crude-oil was discovered, the method of drilling for it, shipping it to the market, and how it is refined. The next question is, how much does it cost to drill, and how many wells have been drilled in the United States; how much money has been invested in drilling for oil since the Fall of 1859, to and including the year 1902.

From the most authentic resources we find that 128,995 wells were drilled in the Appalachian fields, which includes all of the States of Pennsylvania, New York, West Virginia and Southeastern Ohio, from 1859 up to and including 1902; 50,615 wells have been drilled in the Lima field in Northwestern Ohio, from 1884 up to and including 1902; 19,000 wells have been drilled in the State of Indiana from 1860 to and including 1902; 6,000 wells have been drilled in the State of California from 1875 up to and including 1902; 2,000 wells have been drilled in the State of Kentucky from 1860 up to and including 1902; 2,000 wells have been drilled in the State of Texas from 1870 up to and including 1902; 1,500 wells have been drilled in the State of Kansas from 1894 up to and including 1902; 600 wells have been drilled in the Mecca-Belden, Ohio, lubricating oil field, from 1860 up to and including 1902; 400 wells have been drilled in the State of Colorado from 1870 up to and including 1902; 250 wells have been drilled in the State of Wyoming from 1875 up to and including 1902; 125 wells have been drilled in the State of Tennessee from 1862 up to and including 1902; 52 wells have been drilled in Oklahoma from 1875 up to and including 1902; 46 wells have been drilled in the Indian Territory from 1875 up to and including 1902. This makes 211,573 wells drilled in the United States. This does not include water wells or test wells drilled in other States not mentioned.

Eight hundred million dollars have been invested in production, that is, in taking the crude oil out of the ground; this includes the leases, rentals, bonuses, options and rigs. An oil rig consists of the derrick, engine and belt-house, and all woodwork about a well, casing, tubing, rods, boilers and engines, tanks, pipes and connections. As a rule the drilling is let by contract; the

man who takes the contract to drill a well is called a "contractor." He hires the drillers, tool-dressers, and furnishes the drilling, fishing, and casing tools, cables or ropes, and all tools needed in drilling a well. The contractor receives 30 cents to $2.00 per foot for drilling the well. After the oil is brought to the surface it must be stored, transported, and refined. The money invested in pipe-lines, refineries, tanks and tank cars and their necessary adjuncts is given as $900,000,000; in round numbers, $1,700,000,000 has been invested in the oil industry in forty-four years.

TALK ABOUT MONEY.

From the drilling of the first well in 1859, to the close of the year 1903, the price of petroleum-crude oil has fluctuated between $20.00 a barrel in 1860 to ten cents a barrel in 1862. The market at this writing is $1.56 per barrel. The Lima, Ohio, Indiana, Kansas, Texas and California oil fields averages $1.00 per barrel. The average would be about $3.00 a barrel during the forty-four years. Of the 211,573 wells drilled in the United States, one-third were dry holes; while the others produced from 1859 to and including 1902 over 1,080,800,000 barrels of oil. The production of crude oil in 1902 was 80,894,590 barrels. Figured at this average price the total production would represent a value of nearly $3,200,000,000. John D. Rockefeller, the richest man in the world, is at the head of the oil operations, the richest industry in the world. At the present rate of interst Mr. Rockefeller will be a billionaire in less than ten years. The number of men employed in the actual production of oil is nearly three hundred thousand. These are drillers, tool-dressers, rig-builders, pumpers, roustabouts, and teamsters. Those who are dependent upon the production of oil for a livelihood number in the hundreds of thousands. The Standard Oil Company alone employs 40,200 men; this company has an agent, or delivery tank-wagon, or a number of them, in every town or city in the United States, Canada, Mexico, South America and Europe.

THE EARLY DEMAND FOR AND SALE OF CRUDE OIL AND THE ORIGIN OF THE FIRST OIL MARKET.

Nathaniel Cary, of Venango county, Pa., gathered oil on Oil Creek and took it to Pittsburg, Pa., and sold it as a medicine from 1800 to 1808. Robert McKee struck oil in his salt well at Dudley, near Caldwell, Noble county, Ohio, in May, 1816. The natives used it and called it "devil's grease." From 1840 to 1850 Bushrod Creel gathered from the sand diggings on his farm on the Hughes River, in Wirt county, W. Va., oil that he sold Bosworth, Wells & Co., of Marietta, Ohio, and other people, as a remedy. Bosworth, Wells & Co., Marietta, Ohio, bought and sold crude oil from 1840 to 1846.

In 1846 Samuel Kier, a Pittsburg druggist, bottled crude oil taken from his salt well at Tarentum, Pa., and sold it as a remdy to cure everything to which human flesh is heir to, from colic to consumption and Bright's disease.

From 1840 up until the Drake well was struck in 1859, the natives along Oil Creek gathered the oil with blankets or log coops that floated on the water from the oil springs or seeps. This oil they sold as Seneca oil. James Dutton struck oil near Macksburg, Ohio, in July, 1852. His well over-supplied the demand for medicine oil, and is the first record in history where the oil market was broke by a greater supply than a demand for crude oil. One afternoon in the summer of 1853 while out hunting, William Taylor discovered a dark, greasy substance on the water of a spring at Mecca, near Warren, Ohio. He gathered the oil from the top of the water by means of a flannel cloth, and bottled and disposed of it as "British Oil," then a remedy largely sold on the market for curative purposes.

From 1856 to 1858 John D. Angier skimmed oil off the water of the oil springs at the junction of Oil and Pine Creeks, and sold the most of it as medicine. On the 27th of August, 1859, the Drake well was drilled in, and began to produce twenty barrels of oil a day, which fully supplied the demand of the shale oil refiners. In a short time other wells were drilled on Oil Creek, which more than supplied the demand for oil. The over-production at some of the wells allowed the oil to run into Oil Creek. A number of children and men began to dip oil and store it in barrels, or anything that would hold it. After a short time oil buyers began to buy oil from the dippers as well as the oil producers to make up their cargo to float down Oil Creek, and the Allegheny River to the refineries at Pittsburg. Soon the oil dippers began to own tanks that held 10, 50, 100 or 250 barrels of oil, and into those tanks the dippers dumped the oil they dipped and stored it for the highest price they could get from the refiners on the Creek or the shippers to Pittsburg and other refining points. After the producers got to take better care of their oil very little ran away. This was the means of doing away with the oil dippers. However, the oil dippers were not to be outdone. They began to go around to the producers and buy the non-merchantable oil that came from the bottom of the well-owners' tanks, known as B. S. (below standard). They would barrel the B. S., and haul it to their tanks and dump it. Then they would steam the B. S., and after it settled they would draw the water off and sell the oil to the refiners, and in this way they became known as the dump men. The dump man developed into a refiner later on, and was known as the B. S. refiner; that is, he bought B. S. oil and redeemed the better parts of it and placed it on the market.

The dump man visited the small producer in all localities, bought his oil at so much, by contract, and if there were one or two feet in the tank bottom he bought it in a lump sum, or at so much per barrel. He also bought the good oil from small producers who could not hold their oil long enough to get a full tank. The wells had declined to such a point that the owners could not hold their oil for a month at a time, and were obliged to sell from day to day or week to week. The dump man was their market. When the refiners from

Pittsburg, Cleveland, New York, Erie and Philadelphia sent their representatives in the oil region to purchase crude oil, and they used to travel up and down Oil Creek like platoons of cavalry, pricing oil at various wells, the usual method of approaching the producer was to say, "Have you any oil to sell?" The answer would be, "Yes, I have so many feet of oil in the tanks, or so many barrels." The producer would say, "What price are you giving to-day?" If it was thought the producer was not posted on existing prices the trader would probably reply, "What is the dump man paying?" Receiving a reply he might name a figure just enough above it to get the oil. The dump man was the first merchant to make prices in the oil field. His price was steady all the time. You could always market with the dump man.

At this date all of the refiners in the Oil Creek valley let their benzine go to waste. They burned it as refuse oil or gave it to the owners of the wells. The producers would take or haul this benzine from the refineries to their wells and "benzine, or flood the well," as it was then called. Connections were made to the benzine in barrels on the derrick floor to the casing head of the well. The benzine would run down the well and remove the paraffine, or rod wax, from the wall and sand formations of the well. This was called flooding, or cleaning, the sand in the well, and at the time was reported to make the wells produce more oil. The benzine would mix with the paraffine and the fresh oil as it passed from the sand, and in that state would be pumped from the well into the tank, and the producer would sell it to the dump man as pure oil, and he in turn would sell it to the refiner.

Sometimes as much as twenty barrels of benzine would be given away free by one of the oil refiners to a producer to flood his well. The producer would sell the mixture to one of the dump men with one or two hundred barrels of oil, not mentioning the fact that he had flooded one of the wells with benzine. The dump man, in turn would sell this oil to the refiners, and perhaps the refiners who gave the benzine to the producer as a present for hauling it away would, unknowingly, buy the same benzine back through the producers' agent, the dump man paying as high as $3.00 and $5.00 a barrel for it. In a short time the refiners were making more benzine than all the ingredients put together from the oil. This led the refiners to suspect that something was wrong, and upon investigation found the producers and dump men were selling them benzine mixed in the crude oil. This led the refiners to quit buying from the dump men. They employed agents to buy their oil.

This led up to the use of the instrument called a "thief," to test the oil to see if it contained benzine or water. In the course of time the dump man was succeeded by the refiners' agents. Oil sold through refiners' agents during the first ten years of the business. These agents were migratory, that is, they moved about through the oil region, making individual contracts with producers and others. Their meetings would occur at night. They would meet in the evening, after supper, and discuss the trade. That was the origin of the first oil exchange. Later on, as the business became systematized in a few hands, they began to adopt regular hours for business, and one of their first resolutions was to do no trading after a certain hour (6 o'clock in the day). Later on they adopted a resolution to do no trading after 4 o'clock. Banking hours were adopted for their trading, but that was when the oil exchange became a permanent factor in the trade. All the trading from 1875 to 1895 was done in the oil exchange.

Trading done outside of the exchange was known as curb-stone trading, and was not considered respectable, and was classed with "bucket-shop" operations. The rapid fluctuations in oil in 1876 did a great deal to foster the exchange element and to show people that it was possible to make money rapidly by these wide fluctuations. The sudden advance of three dollars a barrel for oil in 1876 brought the public into speculation with the oil producers. This was the beginning of the speculators on the exchange to manipulate prices in ways not justified by new production or market conditions. Producers themselves sometimes sold oil to themselves at higher prices in order to fix the price for the Standard Oil Company, which held millions of barrels of oil in storage.

Speculators also resorted, especially during the early eighties, to the practice of circulating false rumors concerning the production and discovery of new wells for the purpose of illegitimately influencing prices in oil. Out of this evil grew the practice of the large producers and speculators of employing "oil scouts" to watch the new wells drilled in the different oil fields, and especially the new wells drilled in new territory, known to the oil men as "wildcat wells," to secure information as to the production of the new wells. The large stocks of oil which were on hand during that period enabled the "bear" speculators to sell short in large quantities without ever covering their sales; and the effect was to depress prices to producers. This was the condition of affairs when "the great wildcat mystery of 646" was drilled in, which at once broke the market. The price for crude oil in the year 1882 was as follows:

Prices of certificates of crude oil closed January 3, 1882, at 81¼c, against 88⅞c on January 3, 1883, an advance of 7⅝c on the year. Transactions in certificates were not heavy during the first four months of 1882. The average price for January was 83⅛c, the highest 86⅞c, lowest 79¼c. In February the lowest was 80⅞c, the highest 88¾c, and the monthly average 85c. The tendency of prices was down. The highest price in March was 84⅛c., the lowest 78½c., and the average 81c. In April prices continued the lower course, the highest being 80⅝c., the lowest 75⅛c. and the monthly average 81c. In May the top figure reached was 76½c (the 4th). From that date the drop continued through the month, closing at 55½c ,the average for the four weeks be-

ing 71½c. June witnessed lower prices and some fluctuation, 64c being reached on the 2d. Later however, 51⅛c was touched, and on the 30th 53c; the monthly average was 54⅜c. On July 6 the lowest figure was reached, 49⅜c, the highest for the month being 63⅛c (on the 31st), and the monthly average 57⅜c. August was dull, and prices remained heavy, production in Cherry Grove being at its flood; 61½c was the highest, 54½c the lowest, and 58⅝c the average price. More animation was noted in September, as it had become known that the Cherry Grove region was rapidly declining. The lowest price was 53⅜c, the highest 95c, and the average 72⅛c. October saw prices touch 99c and drop again to 88c, the average being 93¾c.

November's fluctuations were marked and violent. The highest price was $1.36 (on the 6th), the lowest 87c, and the average $1.14½. The month's sales of certificates was enormous. December was a quieter month, but furnished the final spasm of the year in the shape of a panic, resulting in heavy losses—to those best able to stand them. The highest price was $1.16¾, the lowest 74¾c, and the average price 92¼c.

The oil market from its beginning up to 1895 was governed by the "bulls" and "bears," and not by the supply and demand. This led the Standard Oil Company to adopt a new system, and on January 23, 1895, the Seep Purchasing Agency, of Oil City, on behalf of the Standard Oil Company, posted a notice that thereafter the prices paid by it for crude oil to oil producers would be "as high as the markets of the world will justify, but will not necessarily be the price bid on the oil exchange for certificate oil." This change was rendered necessary from the fact that very little oil was actually being sold on the exchanges, and the Standard Oil Company, through its several pipe line systems, to accommodate its customers, opened a Seep Purchasing Agency in all of its pipe line offices, where the holders of oil in the pipe line could sell their oil.

THE OIL MARKET MONDAY, JANUARY 11, 1903.

The Seep Purchasing Agency posted the following price it would pay for credit balance oil:

Pennsylvania crude oil	$1.85	per barrel
Tiona, Pa	2.00	" "
Corning, Ohio	1.65	" "
New Castle	1.72	" "
North Lima	1.36	" "
South Lima	1.31	" "
Indiana Trenton Rock oil	1.31	" "
Whitehouse, Tenn	1.30	" "
South Neodesha, Kan	1.36	" "
North Neodesha, Kan	1.16	" "
Neodesha, heavy oil	.60	" "
Bartlesville, Indian Territory	1.14	" "
Somerset, Kentucky	1.30	" "
Ragland	.66	" "
Corsicana, Texas, (light)	1.27	" "
Corsicana ,Texas, (heavy)	.55	" "
Petrolia, Ontario	2.32	" "

The Producers and Refiners Oil Company also quoted $1.85 for Pennsylvania crude oil.

Credit balances is the number of barrels of oil in the pipe line credited to the owner, for which a receipt in the shape of a negotiable oil certificate is given. The oil is stored in the pipe line company's large iron tanks, free of storage for the first fifteen days; after that a small storage is charged. In case of fire or loss of the oil by accident, the owners lose a percentage of their oil, the pipe line company runs no risk, as they act as the owner's agent, in case of accident. This is called "general average." Ninety per cent of the oil is bought by the Standard Oil Company, through checks issued on the Seaboard National Bank of New York, indorsed by Joseph Seep, the purchasing agent.

The Oil Market from 1860 to 1904

Monthly and yearly average prices of pipe-line certificates of Pennsylvania crude petroleum at wells in daily market, 1860-1904.

[Per barrel of 42 gallons.]

Year	January	February	March	April	May	June	July	August	September	October	November	December	Yearly average
1860.....	$19.25	$18.00	$12.62½	$11.00	$10.00	$9.50	$8.62½	$7.50	$6.62½	$5.50	$3.75	$2.75	$ 9.59
1861.....	1.00	1.00	1.00	.62½	.50	.50	.50	.25	.20	.10	.10	.10	.49
1862.....	.10	.15	.22½	.50	.85	1.00	1.25	1.25	1.25	1.75	2.00	2.25	1.05
1863.....	2.25	2.50	2.62½	2.87½	2.87½	3.00	3.25	3.37½	3.50	3.75	3.85	3.95	3.15
1864.....	4.00	4.37½	5.50	6.56	6.87½	9.50	12.12½	10.12½	8.87½	7.75	10.00	11.00	8.06
1865.....	8.25	7.50	6.00	6.00	7.37½	5.62½	5.12½	4.62½	6.75	8.12½	7.25	6.50	6.59
1866.....	4.50	4.40	3.75	3.95	4.50	3.87½	3.00	3.75	4.50	3.39	3.10	2.12½	3.74
1867.....	1.87½	1.85	1.75	2.07½	2.35	1.90	2.62½	3.15	3.40	3.55	2.50	1.87½	2.41
1868.....	1.95	2.00	2.55	2.82⅛	3.75	4.50	5.12½	4.57½	4.00	4.12½	3.75	4.35	3.62½
1869.....	5.75	6.95	6.00	5.70	5.35	4.95	5.37½	5.57½	5.50	5.50	5.80	5.12½	5.63½
1870.....	4.52½	4.52½	4.45	4.22½	4.40	4.17½	3.77½	3.15	3.25	3.27½	3.22½	3.40	3.86
1871.....	3.82½	4.38	4.25	4.01	4.60	3.85½	4.79	4.66	4.65	4.82½	4.25	4.00	4.34
1872.....	4.02½	3.80	3.72½	3.52½	3.80	3.85	3.80	3.58½	3.25	3.15	3.83½	3.32½	3.64
1873.....	2.60	2.20	2.12½	2.30	2.47½	2.22½	2.00	1.42½	1.15	1.20	1.25	1.00	1.83
1874.....	1.20	1.40	1.60	1.90	1.62½	1.32½	1.02½	.95	.95	.85	.55	.61½	1.17
1875.....	1.03	1.52½	1.75	1.36½	1.40	1.26½	1.09	1.13	1.33	1.32½	1.44	1.55	1.35
1876.....	1.80	2.60	2.01	2.02½	1.90½	2.01¾	2.24½	2.71⅜	3.81	3.37½	3.11	3.73	2.56¼
1877.....	3.53¼	2.70	2.67½	2.58	2.24	1.94⅝	2.07½	2.51	2.38	2.56¾	1.91	1.80	2.42
1878.....	1.43	1.65¼	1.59	1.37½	1.35¼	1.14	.98¾	1.01	.86⅝	.82½	.89⅜	1.16	1.19
1879.....	1.03	.98	.86¼	.78½	.76	.68⅜	.69⅞	.67⅛	.69⅜	.88½	1.05⅝	1.18½	.85⅞
1880.....	1.10¼	1.03⅛	.88¾	.78	.80	1.00	1.06¼	.91	.96	.96⅞	.91⅞	.91⅝	.94½
1881.....	.95½	.90⅜	.83⅜	.86¼	.81⅞	.81¼	.76⅞	.78⅛	.97⅛	.91¼	.85¼	.84⅜	.85⅞
1882.....	.83⅛	.84½	.81⅜	.78⅜	.71½	.54⅜	.57⅜	.58⅞	.72⅛	.93¾	1.14	.96	.78⅛
1883.....	.93¾	1.01	.97⅝	.94⅜	1.00⅛	1.16⅜	1.05⅞	1.08	1.12½	1.11⅛	1.14½	1.14¾	1.05¾
1884.....	1.11	1.04⅜	.98⅛	.94	.85⅝	.68⅝	.63½	.81⅞	.78	.71⅛	.72½	.74⅜	.83½
1885.....	.70⅞	.72⅜	.80⅜	.78½	.79	.82	.92½	1.00¼	1.00¾	1.05½	1.04⅜	.89⅝	.87⅞
1886.....	.88⅜	.79⅞	.77¼	.74⅞	.70	.66½	.66	.62⅛	.63⅜	.65⅛	.71⅝	.70⅝	.71¼
1887.....	.70	.64⅝	.63⅜	.64⅞	.64½	.62⅝	.59¼	.60⅛	.67	.70⅞	.73⅞	.80¾	.66¾
1888.....	.91¼	.91⅝	.98⅝	.82⅝	.86¾	.75⅞	.80⅝	.90⅛	.93⅝	.90⅝	.85⅜	.89¼	.87⅝
1889.....	.86⅝	.89¼	.90⅞	.88	.83⅛	.83⅞	.95⅛	.99½	.99⅛	1.01⅜	1.08½	1.04⅛	.94⅛
1890.....	1.05¾	1.05⅛	.90	.82⅝	.88⅞	.89¼	.89⅛	.89¼	.81⅞	.80⅛	.72⅜	.67¼	.86¾
1891.....	.74¼	.78⅜	.74¼	.71½	.69¾	.68⅛	.66½	.64	.58½	.60½	.58¾	.59⅜	.67
1892.....	.62⅜	.60¼	.57⅛	.57⅞	.57⅜	.54⅛	.52½	.55	.54⅜	.51⅜	.52	.53¼	.55⅝
1893.....	.53½	.57⅜	.65¼	.68¾	.58¾	.60¼	.57⅜	.58⅞	.64⅜	.70¾	.73⅞	.78¼	.64
1894.....	.79¾	.80⅝	.82	.84¼	.86	.89⅜	.83⅛	.81	.83	.83	.83	.91½	.83⅞
1895.....	.99	1.04⅜	1.09¾	1.79	1.74¼	1.53⅝	1.46⅝	1.26⅛	1.22⅜	1.24¼	1.48⅜	1.42	1.35⅞
1896.....	1.42⅝	1.36⅝	1.28½	1.22½	1.15⅜	1.14¾	1.08¼	1.05	1.12	1.15	1.16	.98	1.17⅞
1897.....	.88	.90⅛	.92⅛	.85⅞	.86¾	.86¼	.76⅜	.71	.69¾	.67⅜	.65	.65	.78⅜
1898.....	.65	.67¾	.78⅝	.73¼	.82¼	.87⅛	.93¼	.97⅝	1.01¾	1.13⅛	1.16⅜	1.17½	.91⅛
1899.....	1.17	1.15	1.13	1.13	1.13	1.13¼	1.22⅜	1.27½	1.44½	1.50⅞	1.57⅜	1.65⅛	1.29⅜
1900.....	1.66⅝	1.68	1.68	1.55	1.39⅜	1.25½	1.25⅝	1.25½	1.23	1.10⅜	1.06¾	1.08¾	1.35¼
1901.....	1.19½	1.25	1.29	1.20½	1.07⅝	1.05	1.13⅜	1.25	1.25⅜	1.30	1.30	1.21	1.21
1902.....	1.15	1.15	1.15	1.17½	1.20	1.20⅜	1.22	1.22	1.22	1.28¼	1.38¼	1.49	1.23¾
1903.....	1.52½	1.50	1.50	1.51	1.51½	1.51	1.52½	1.56	1.57½	1.68½	1.78⅜	1.88¾	1.59

The producers of Pennsylvania high-grade oil should receive five cents a gallon for their crude oil, the pipe lines to receive one-half cent a gallon for transporting the oil from the wells in the oil fields to the interior oil refiners, and one and one-half cents a gallon to the seaboard refiners; the refiners to receive five cents a gallon on all grades of oil and supply barrels when required on all oil refined and shipped; the wholesaler to receive from one to two cents a gallon; the retailer to receive one to two cents a gallon; the railroads to receive not over one cent a gallon for freight on oil shipped over fifty

miles from the refiners or pipe lines, and the consumer not to pay over sixteen cents a gallon for the best grade of refined oil.

OIL AND GAS LEASE AS IT IS WRITTEN AT THE PRESENT DAY.

This lease, made this fourth day of January, A. D. 1905, by and between William B. Snow, of the County of Tyler, and State of West Virginia, of the first part, and Charles A. White, of Warren, Pennsylvania, of the second part,

Witnesseth, That the said party of the first part, in consideration of the stipulations, rents and covenants hereinafter contained, on the part of the said party of the second part, his executors, administrators and assigns, to be paid, kept and performed has granted, devised and let unto the said party of the second part, his executors, administrators and assigns, for the sole and only purpose of drilling and operating for petroleum oil and gas, for the term of five years, or as long thereafter as oil or gas is found in paying quantities, all that certain tract of land situated in Lincoln district, Tyler county, and State of West Virginia, bounded and described as follows, to-wit: On the east by lands of James Monroe; on the north by lands of Peter Smith; on the west by lands of Robert Bright; on the south by lands of Samuel Lytle; containing two hundred acres, more or less. The said second party hereby agrees, in consideration of the said lease of the above premises, to give said first party one-eighth (⅛) of all the oil or mineral produced and saved from said premises; and further agrees to give $250.00 per annum for the gas from each and every well drilled on the above described premises, in case the gas is conducted and used off the above described premises. The said second party not to unnecessarily disturb the growing crops thereon, or the fences.

Said second party has the right, which is hereby granted to him, to enter upon the above described premises at any time for the purpose of mining or excavating, and the right of way to and from the place of mining of excavating, and the exclusive right to lay pipe lines for the purpose of conveying or conducting water, steam, gas or oil over and across said premises; and also the right to remove at any time any or all machinery, oil well supplies, or appurtenances of any kind belonging to said second party.

The party of the second part agrees to complete one well within six months from the date hereof, and in case of failure to complete one well within such time, the party of the second part hereby agrees to pay thereafter to the party of the first part for any future delay the sum of two hundred dollars per annum, within three months after the time for completing such well as above specified, payable quarterly to William B. Snow, at his home. And the party of the first part hereby agrees to accept such sum as full consideration and payment for such yearly delay until one well shall be completed, and a failure to complete one well or to make any such payments within such time and such place as above mentioned, renders this lease null and void, and to remain without effect between the two parties.

It is understood by and between the parties to this agreement that all conditions between the parties hereto shall extend to their heirs, executors and assigns.

In Witness Whereof, We, the said parties of the first and second parts, have hereto set our hands and seals the day and year first above written.

WILLIAM B. SNOW, (L. S.)
CHARLES A. WHITE, (L. S.)

Witnesses:
George E. Black,
Henry Hughes.

THE HISTORY OF THE OIL EXCHANGES. WHERE SEVERAL FORTUNES WERE WON AND LOST IN ONE DAY.

An interesting feature to the visitor in the oil country during the early days was the brokerage business. It was as interesting as it was surprising. A visitor to the section and trade, calling at the different exchanges in existence, seeing the number of brokers and dealers engaged, and these augmented on the arrival of every train, the constant coming and going of telegraph messages, and listening to the terms used, found himself in a new world, where thousands on thousands of dollars' worth of property changed hands with an indifference and ease which astonished and bewildered him.

In 1868 brokerage was started by a few individuals, and for some time was chiefly confined to buying for refineries in Pittsburg, Philadelphia and New York. In most cases the brokers were paid by the buyers a commission of ten cents per barrel, and this was sometimes increased by an additional five cents per barrel by the seller. At the outset the business was a matter of experiment, but soon the attention of other parties was attracted thereto. New men entered the ranks, and the whole thing was placed on a legitimate basis by the formation of brokers' boards in the cities where the heaviest trade was carried on ,and the establishment of regular rates of brokerage.

In 1869 Erie "cornered" the market, and by the large transactions in crude oil at the wells, influenced the refined markets in New York and Cleveland, thus bringing them in as extensive buyers and opening these important points to the brokers. At that time the broker assumed a more important position in the commercial world, and all over the oil country, wherever the fluid was produced or shipped, either crude or refined, the greater part of the transaction was executed by the broker. His business consisted of buying and selling "spot," "regular," or "future." As these expressions or terms as used will convey to the uninitiated no idea of the particular trade named, a few words may be appropriately given in explanation. "Spot" was the

term used when the oil was to be removed and paid for immediately; "regular" was where the buyer was allowed ten days in which to put in the cars and take out the oil. These were parole contracts and without writings, the broker acting under orders from his principal, whom he named to the other party, and he being often the witness to the trade; but in case of the "future" this was not the custom, as the fulfillment of these took place at the expiration of the agreed time. A written contract was drawn up by the broker and was signed by him as such. This was accepted by both parties and was equally binding, the one agreeing to sell and the other to take a certain quantity of oil within a certain period of time, at a price named in the contract, which also specified that the party in whose favor the contract was drawn should give the other ten days' notice within which to remove the oil.

Regular future contracts were buyers' and sellers' options. In the first the buyer had the right to demand the oil at any time and by the last the seller could put it in whenever he choose, all within the time named in the contract. By these contracts the buyer was also bound to take the oil or pay, or take a difference in money, according as the trade had proved in his favor or against him, and this difference was that between the contract price and the regular market rate on the last of the ten days' notice.

METHODS THAT PREVAILED.

The "regular" contracts are spoken of because there was a species of contract by which the amount of difference was named and limited at the start. These were called "puts" and "calls." A "put" was where one party agreed to give a certain sum of money to be paid at once for the privilege of delivering a named quantity of oil at a price also named, within an agreed time.

A "call" was when the money was paid or the right to call on the other to deliver the oil. In these cases the prices of the "put" or "called" oil was generally higher than the rate of regular contracts for the same time. This was because it was a one-sided affair, since under no circumstances could the acceptor of the offer get more than the amount bid, whilst if the market went against him he was obliged to settle the difference at what may have proved a heavy loss.

In all regular contracts the seller paid the brokerage, but in these irregular trades there was no established custom as to which of the parties it was due. In New York and Oil City the commissions differed, and this was an obstacle in this business to which brokerage in other commodities was not liable. I refer to the fact that in all "futures" the broker had to wait for fulfillment of the contracts ere he could collect his commission, and if either party failed he lost his pay. By this he was actually made to insure the solvency of both parties to the amount of his brokerage, which was a manifest injustice. His business ought to end with the issue and acceptance of the contract, and though it was customary for brokers to attend to the taking or delivery of oil for their principals, they got no additional pay for their extra service.

In a business like this the market in years gone by fluctuated greatly. A combination was frequently formed to lower or raise the price of oil, and this was especially the case as the time approached when a number of contracts matured. The "bulls" and "bears" were then rampant, and the talk was all the "long" and "short" order. When the oil market was lively the close of the first and last half of the year was generally marked by some such struggle, and the brokers bought and sold thousands of barrels of "paper" oil so as to effect settlements of six months' contracts that were coming due.

WERE CLOSELY ALLIED.

Brokers were, by the nature of their business, very closely connected. Each generally had correspondents in different cities where there was an oil exchange, with whom to share the brokerage arising from the purchase of the sales made through their joint exertions; and it sometimes happened that each broker was obliged to call in the oil till the commission was so divided and subdivided that it would hardly pay the telegraph bills of the different parties. In fact, brokerage was a hard-worked and poorly-paid profession, and yet there was an excitement about it that formed a great attraction. The men were a jolly, jovial set, free and generous with their money and kind offices, and as there was a business where much was of necessity left to their honor, each man took a pride in keeping his word on an equal footing with his bond.

During 1878, by the exertions of prominent men identified with the trade, regular exchanges were established in Titusville and Oil City, and later on in Pittsburg, New York, Warren, Bradford and Parker. The one at Oil City was opened Tuesday, April 23, 1878. It was a gala day for that place, it being at that time the most important commercial event in the history of that city, and to the speculative oil business, more than anything else, is Oil City indebted for the appellation "Hub of Oildom." The pipe line certificates afforded an excellent medium for speculation, and the commodity they represented was then subject to fluctuations of 5 to 50 per cent. In a single year the clearances exceeded 11,000,000,000 barrels. Business was booming and the brokers had business from nearly all quarters of the country.

The forerunner of these institutions was the "Curbstone" exchange at Oil City in 1870. Business was done on the street, and producers, operators and spectators would congregate on the sidewalk, discuss the situation, tell stories and buy and sell oil. Trades were made in offices, at wells, and everywhere. The business was at fever heat, and everybody who had a few dollars was "in it." Business rapidly increased, and rooms were rented which were used until the formal opening of the exchange, as stated above, took place.

The application of the clearing-house system in 1882 simplified the routine and facilitated deliveries. The volume of business was immense, the clearances often amounting to 10,000,000 or 15,000,000 barrels a day. Only the New York and San Francisco stock exchanges surpassed it. During rapid fluctuations the galleries would be completely packed with men and women who had taken a "flyer" and watched the antics of the bulls and bears intently. To a stranger the place seemed like a mad-house with all its inmates turned loose. Pandemonium reigned supreme; at times it was almost impossible to understand what a person was saying, although yelling at the top of his voice not a distance of a foot away from you.

BRADFORD'S OIL EXCHANGE—SOME REMINISCENCES OF THE PANIC OF BLACK THURSDAY, DECEMBER 9, 1882.

The Bradford Oil Exchange was one of the largest in the oil country. It had a handsome brick building on Main street. At the sides of the large hall were reading rooms, a parlor and coat rooms. The bull ring across which the brokers waved their arms and yelled at one another was a stout nickel-plated railing in the center of the hall, enclosing an oblong space some twenty feet long and eight feet wide. Over the entrance was a gallery, which used to be open to visitors, but the seats in it later were rented to speculators who desired to watch the market for opportunities for quick turns. Though only one commodity was dealt in, the shouts that were hurled across the bull ring were joyous to a stranger. "Sell five for a quarter!" yelled repeatedly, with the waving of hands, means that the noisy broker wanted to sell five thousand barrels of crude petroleum, represented by a certificate of one of the pipe lines, for $1.13¼—or whatever the figures ending with ¼ may be—per barrel, deliverable on the following day. "Sell five, cash, for a quarter," means the same, except that the delivery is to be made in time to be reported at the clearing-house on the day of the transaction. "Thirteen and a half for five, seller next week," signified that the crier wanted to sell five thousand barrels of oil for $1.13½ a barrel delivered at any time the seller may select in the following week. By substituting "buyer" for "seller" the option was given to the purchaser. Transactions made before 11 o'clock a. m., and specified as "cash" were reported to the clearing-house before 12 30 p. m. of the succeeding day. The expenses of the clearing-house, in which the accounts of the brokers with one another are balanced, are assessed upon members of the exchange in proportion to the magnitude of their transactions. The hours for business in the exchanges are from 10 a. m. till 12:30 p. m., and from 1:30 till 4 p. m. In the evening the brokers gather in the exchanges to deal in puts and calls.

It is doubtful whether Black Friday in New York produced a wilder panic than that which reigned in the Bradford Oil Exchange when on November 23 the market dropped in two hours from $1.14½ to 97 cents. Certainly nothing approaching it had ever been seen in the oil region. The market opened at $1.12 and very sensitive. The downward tendency was stoutly resisted by the bulls throughout the forenoon, and when the gong struck the game did not stand greatly in favor of the bears. The crowd had hardly gathered around the bull ring in the afternoon before the market began to fall to pieces. Point after point was lost; and, gradually at first, but with mad haste later on, those who had been bulling the market developed into bears. In the corridor of the exchange was a dense throng, in which there were a number of women, whose possessions were growing less at every drop of the market. The crowd extended to the sidewalk and spread out, up and down the street. News of the break had spread throughout the town, and merchants, mechanics, clerks, bookkeepers, day laborers and men of almost every avocation left their duties and hastened to the scene of the excitement. Some had to stay only long enough to hear the first news that came from within the closed doors. It told them that they had lost all they had to lose, and with blanched faces they turned away. Brokers howled themselves hoarse in their efforts to find their customers and call for a renewal of margins. Telegrams of bearish character were flowing into the exchange from the other oil centers, and these contributed to the excitement that was every minute growing wilder about the bull ring. The scene when an excited broker leaned over the ring and shouted his offer to sell fifty thousand barrels at one dollar became indescribable. Another broker had to drop sixty-four thousand barrels because his customers could not or would not make good their margins. Panic reigned in the gallery, where the excited speculators rose to their feet, waved their hands and shrieked in fruitless endeavor to attract the attention of their brokers, who were packed around the ring, struggling for foremost places, gesticulating wildly, and shouting at the top of their voices their offers to sell.

On one of the benches at the west side of the hall sat a woman, the wife of a railroad mechanic, whose pale and twitching face betrayed the suffering she was enduring. She had been buying oil on a rising market, investing her husband's wages and all the money she could spare in margins. The market had continued to advance till the time came when she could have sold out at a profit, according to common report, of forty thousand dollars. She saw this fortune melting away and was powerless to check the ruin. How she came out of the wreck is known to few, if any, besides herself and her broker.

NAMES OF OFFICERS AND MEMBERS OF THE SEVERAL OIL EXCHANGES FROM 1882 TO 1886.

THE TITUSVILLE OIL EXCHANGE.

The following is a list of the Titusville Oil Exchange in 1882, of which Mr. A. P. Bennett was President; Mr. M. W. Quick, Vice President, and Mr. C. M. Coburn Secretary: Members: A. L. Ackerman, I. E. Ackerly, M. N. Allen, Samuel Ames, F. W. Ames, Dr. M. Bailey, C. S. Barrett, F. Q. Barstow, N. B. Barnsdall, Fred Bates, L. Beaumont, W. D. Beebe, B. D. Benson, W. B. Benedict, A. P. Bennett, George L. Benton, M. B. Bettis, H. C. Bloss, Marcus Brownson, W. J. Booth, R. H. Boughton, Jr., S. P. Boyer, S. Q. Brown, J. W. Butters, W. A. Byers, Julius Byles, J. A. Cadwallader, H. P. Chamberlain, J. H. Caldwell, J. J. Carter, Charles Castle, T. P. Chambers, G. A. Chase, Lanman Chase, C. M. Coburn, J. H. Cogswell, J. H. Cogswell, Jr., Manley Crosby, James H. Davis, J. H. Dingman, J. A. Dower, J. R. Drum, J. A. Dunn, G. B. Esterly, B. F. Edwards, David Emery, E. O. Emerson, E. H. Eddy, S. P. Franchot, Nelson Farel, John Fertig, S. S. Fertig, R. D. Fletcher, E. B. Frew, C. B. Friedman, D. W. Field, D. H. Fisher, C. N. Fuller, W. S. Gwaltney, H. C. Grenner, D. R. Greene, F. H. Gibbs, George Gilimor, M. B. Groesbeck, M. C. Goss, J. M. Guffey, H. M. Haskell, R. W. Hall, Edgar Hale, G. R. Harley, A. C. Harton, J. M. Henderson, William M. Henderson, H. L. Hershberg, F. A. Hill, E. C. Hoag, Joseph Hoenig, F. M. Hooper, J. M. Hooper, R. E. Hopkins, E. A. Houard, A. B. Howland, G. C. Hyde, J. W. Jackson, B. F. Kraffert, O. Keese, R. L. Kernochan, A. T. Knowlson, John Lammers, E. P. Landas, R. H. Lee, Frank Loomis, W. P. Love, William Loverock, T. S. McFarland, T. A. McLaughlin, M. B. McManus, J. W. McClellan, W. T. McKee, David McKelvy, J. C. McKinney, J. L. McKinney, John McCort, Joseph McDonnell, C. Merrill, F. L. Mitchell, R. J. Moorhead, B. E. Moreland, J. A. Morley, J. A. Neill, C. H. Newkirk, W. H. Nicholson, Frank P. Nuse, Daniel O'Day, James Parshall, S. W. Parshall, C. N. Payne, F. M. Pratt, A. N. Perrin, John Pitcairn, Jr., H. Y. Pickering, J. A. Pincott, H. B. Porter, James Purtill, W. A. Pullman, M. W. Quick, A. S. Ralston, W. B .Roberts, E. T. Roberts, M. R. Rouse, J. C. Russell, John Satterfield, I. L. Shank, L. L. Shattuck, N. Shaffner, G. Shamburg, Loomis L. Shattuck, Charles St. John, W. T. Scheide, Joseph Seep, Roger Sherman, W. B. Sterrett, J. D. Sterrett, R. H. Sterrett, D. B. Stewart, Lyman Stewart, Milton Stewart, A. H. Steele, H. C. Stevens, W. B. Stewart, H. F. Sweetser, T. J. Smiley, Jesse Smith, George F. Southard, O .F. Schonblom, C. E. Stewart, Frank Tack, Theodore E. Tack, H. L. Taylor, Taylor Tifft, S. E. Tifft, T. P. Thompson, W. W. Thompson, B. W. Vandergrift, Jonathan Watson, J. A. Waugh, W. H. Wallace, R. A. Watson, E. W. Watson, U. C. Welton, E. Westheimer, I. Westheimer, C. W. White, Isaac Williard, D. O. Wickham, P. T. Witherop, W. J. Woods.

THE BRADFORD OIL EXCHANGE.

Following is a complete list of members of the Bradford Oil Exchange in 1883: C. L. Wheeler, President; J. M. Fuller, Secretary. Members: C. D. Angell, C. C. Adams, D .W. Allen, James Amm, R. R. Armor, F. W. Andrews, C. H. Ames, F. M. Aiken, J. M. Armstrong, F. E. Boden, H. L. Blackmarr, James Broden, A. H. Blomer, H. C. Brooks, H. C. Bosley, W. E. Bullock, A. F. A. Brown, L. A. Brenneman, E. H. Barnum, Thomas Bradley, John Brown, H. E. Brown, W. H. Bradley, A. P. Bennett, Asher Brown, George A. Berry, S. P. Boyer, E. A. Boyne, J. E. Butts, Jr., C. K. Book, E. J. Boyleston, J. E. Blair, W. W. Bell, O. D. Bleakley, J. N. Bolard, W. E. Boyleston, G. S. Bumstead, C. A. Ball, J. C. Brenneman, G. F. Blackwell, J. S. Book, W. P. Book, W. W. Brown, S. G. Bayne, E. C. Bradley, G. H. Brooks, D. D. Babcock, J. C. Chambers, George Chambers, C. S. Clarke, S. E. Critchlow, E. E. Chambers, W. L. Curtis, J. A. Clarke, G. W. Cottebaugh, E. S. Crooker, S. G. Coffin, O. H. Colton, C. H. Cramer, Richard Church, J. H. Cosford, N. R. Collins, W. H. D. Chapin, John Cochran, R. B. Corey, F. J. Conant, Fred Conlin, J. E. Cochran, William Chambers, Nathan Bushnell, Wesley Chambers, J. M. Clapp, Joseph Duke, William Duke, Warren Dow, E. H. Dyer, E. R. Dresser, Rollin Dow, C. M. Dodge, F. A. Dailey, George S. Daniels, Harley Dewolf, H. R. Decker, John Denman, S. H. Durston, A. K. Darrow, F. W. Davis, H. S. Davis, W. G. Evans, F. F. Elliott, Lewis Emery, Jr., M. C. Egbert, W. R. Ewing, J .A. Ege, John Eaton, J. M. Fuller, L. E. Fuller, F. H. Frisbee, H. W. Ford, J. B. Farrell, C. H. Filkins, J. C. Frisbee, H. B. Goe, Frank Gifford, R. H. Gray, Victor Gretter, Bateman Goe, W. G. Gray, J. A. Gartland, Otto Germer, E. N. Hallock, C. R. Huntley, A. Hochstetter, R. T. Hazzard, J. W. Humphrey, Jr., Francis Handel, E. T. Howes, Peter Hannon, H. B. Huff, F. P. Hayes, George C. Howe, S. B. Hughes, W. P. Halderman, B. N. Hurd, L. E. Hampsher, C. E. Hequembourg, J. E. Haskell, I. L. Halderman, A. R. Hacker, W. A .Innes, F. S. Johnson, E. T. Johnson, E. H. Jennings, I. G. Jackson, J. A. Johnson, J. T. Jones, J. B. Jayne, Heman Janes, W. Harry Johnson, A. F. Kent, P. T. Kennedy, John B. Kane, D. W. Longwell, F. P. Leonard, W. P. Logan, Robert Long, Theodore Ladd, Emanuel Levi, R. T. Lain, H. A. Marlin, M. H. Mercer, H. P. Malone, S. W. Mason, A. K. Murray, M. Mattison, W. C. McNish, Robert Moore, C. C. Melvin, William Munhall, F. W. Mitchell, M. Murphy, L. E. Mallory, T. A. McLaughlin, T. J. Melvin, R. P. Miller, M. N. Miles, J. M. McElroy, T. E. McCray, J. M. McCray, W. D. McBride, A. W. Newell, H. H. North, Charles Newell, W. H. Odell, Daniel O'Day, R. H. Owens, C. E. Parsons, W. A. Pullman, C. N. Payne, C. W. Pratt, John Potts, N. D. Preston, R. Painter, T. J. Powers, W. H. Powers, H. J. Pemberton, H. E. Picket, E. W. Marshall, P. W. Roth, O. M. Roberts,

G. L. Roberts, H. O. Robbins, S. M. Reed, D. A. Ralston, S. C. Rhodes, A. Richards, S. G. Slike, C. P. Stevenson, A. J. Stephenson, M. Shaw, Kenton Saulnier, N. T. Saunders, Joseph Schlesinger, D. M. Saunders, L. C. Stanford, James H. Snow, B. F. Smith, W. H. Spain, G. C. Smith, Clark Stewart, H. C. Shearman, R. C. Shearman, S. Solomon, P. M. Shannon, A. B. Smith, Joseph Stettheimer, J. H. Simonds, H. B. Steck, Joseph Seep, O. F. Schonblom, L. H. Smith, Charles Samuels, Louis Suhr, J. B. Steele, Winfield Scott, L. R. Shaw, W. P. Thompson, H. S. Tucker, R. E. Townsend, B. F. Thornton, J. L. Tracy, M. B. Taylor, H. W. Tews, R. H. Thayer, A. J. Thompson, B. I. Taylor, D. P. Thomas, S. W. Vandersaal, T. J. Vandergrift, George H. Van Vleck, W. F. Van Schaik, C. L. Wheeler, E. P. Whitcomb, W. O. Wing, S. A. Wheeler, C. S. Whitney, A. Willoughby, W. R. Weaver, P. L. Webster, C. B. Whitehead, M. Wall, J. F. Wilson, E. D. Warner, A. Warner, A. B. Walker, E. F. Willets, H. M. Walters, H. F. Whiting, A. J. Wellman, Henry White, R. M. Waugh, J. A. Waugh, W. W. White, W. G. Young, A. B. Young, D. G. Young, John P. Zane, W. B. Zielie.

THE NATIONAL PETROLEUM EXCHANGE, 57 BROADWAY, NEW YORK—THE MEMBERS OF THE NATIONAL PETROLEUM EXCHANGE, NEW YORK.

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Following are the names of the members of the National Petroleum Exchange, as obtained from the official records:

Henry Allen, Frank J. Abbor, T. S. Atwater, William Adams, Otto Arens, H. Alton, E. Corning Abell, Eugene Alison, R. L. Anderton, J. S. Baird, J. L. Blood, E. H. Bunker, Charles L. Bartlett, James A. Breen, George W. Bailey, Thomas E. Bailey, S. E. Brainard, W. C. Brose, Henry Bushman, E. L. Brodt, George Brenecke, W. R. Beers, F. F. Beals, J. A. Baker, C. C. Beggs, R. B. Borland, John P. Beal, Caleb C. Bedell, H. H. Barnes, D. Barnes, Asher Brown, F. S. Belton, P. D. Barker, Horace Bird, E. G. Burgis, D. M. Bogert, Jr., Maynard Bixby, George A. Betts, Henry T. Barton, Ed J. Brown, James D. Cummings, Clarence Creighton, Henry S. Church, A. T. Comar, William L. Carbin, L. D. Cordes, W. H. D. Chapin, Lewis Contencin, John Connor, N. F. Clark, B. E. Chitton, T. M. Coekind, E. W. Corlies, J. M. Coleman, Adrian Crucy, John Cattus, A. H. Coheux, O. R. Canchois, Henry Clews, E. J. Donnell, Peter Diestil, H. D. Dumant, Nathan Dole, John W. Davis, Theodore Dorsey, W. H. Dufur, Aaron de Cordova, Alfred de Cordova, C. F. Doane, Clark Dunham, R. L. Dunbacher, W. H. Daly, Solomon Dreyfus, William Diestil, J. Frank Emmons, John H. Evans, John M. Ewen, J. M. Emanuel, Frank Elwood, Thomas Eagen, W. G. Evans, C. F. Eberlin, John M. Forbes, Jr., C. M. Foster, Randall H. Foote, J. Ferro, M. B. Fielding, Charles J. Fraser, A. Fraser, G. E. Foster, C. Foley, Fred Fisher, Isaac Friedenheit, Charles Garlich, H. B. Gombers, Howard Gallups, P. R. Gray, Albert E. Goodheart, William R. Gilbert, Nicholas Groyume, Theodore Goerck, C. Gimbernat, Jonas G. Goldsmith, Jacques Gutman, Wright Gillies, F. A. Gans, Siegf. Gruner, George P. Gray, M. A. Geryoune, James Graham, Felix Gottschalk, J. J. Gould, Henry Geering, James F. Hughes, Harry T. Horton, R. E. Hopkins, John H. Hebert, Augustus G. Hildreth, N. F. Hilton, Fred L. Hebert, John Hartshorne, Henry D. Harris, A. R. Hacker, J. W. Humphrey, Jr., J. L. Hathaway, J. H. Holt, George P. Hart, Oscar Hackmann, A. G. Hetsy, H. B. Hebert, N. E. Haskill, Maurice Hochstetler, R. M. Henning, Rufus Hatch, Jacob T. Hiffelsheimer, N. Helmers, T. E. Harrison, N. L. Hunting, George H. Hopper, J. C. Inches, J. A. Jamerson, P. H. Judd, J. T. Jones, T. K. Jordan, J. B. Jayne, Franz Krohn, John H. Kump, Leon Klopman, Charles Knowd, A. Klein, M. Keating, Jr., J. Otto Koch, F. A. Klemm, Isadore Kahn, C. E. Kimbark, Herman L. Kingsbury, W. F. Kidder, William L. Lay, S. M. Lehman, Phil Lehman, James E. Little, George I. Landon, William Lummis, Henry Lewis, George Lewis, T. A. McLaughlin, Joseph Levi, W. H. Longwell, John L. Lorghi, J. B. Mersereau, J. B. McCue, H. R. Moore, Gouverneur Morris, Lewis Morris, J. McKim Minton, G. A. Morrison F. H. Morrison, F. A. Marsley, R. Muller, Alex. J. Meyer, James O. M. McHenry, Allen W. Masterson, L. A. Morrison, H. B. McKinney, Mont Isaacs, F. M. Maas, J. H. Mayer, H. B. Marks, M. McCarthy, R. J. Morehead, E. Marthens, Harry H. Marks, C. F. Mackenzie, Alex. Marshall, S. G. Murphy, R. S. Masterson, A. Hamilton Morris, S. M. Morris, J. McPherson, Lewis Mendel, A. W. Mitchell, B. Munn, Hugo Muller, D. Blodgett Mumford, J. Newstatter, W. H. Nicholson, W. C. Nally, C. H. Nelson, Frank L. Neall, George N. Nicholas, F. H. O'Connor, William J. Osborne, W. H. Osborne, C. S. Osborne, T. P. Osborne, W. H. Olmstead, George W. Pinchback, George W. Perry, Isaac N. Pratt, M. B. Pierce, W. F. Poucher, Robert G. Powell, A. W. Phingsthorne, F. C. Poucher, John Potts, William F. Pitt, Joel Parker, Alfred Pengnet, Eduardo Pannaci, L. G. Quinlan, M. Ruttenau, W. G. Robinson, G. A. Recknagel, L. L. Robbins, William F. Ryder, Otto Rondebrock, F. William Rondebrock, P. C. Royce, C. A. Righter, Eugene Rubeino, Israel Rich, Christian F. Rust, Joseph S. Rich, Nathaniel W. Raphael, Maurice M. Sternberger, Joseph Sulzbacher, John S. Shaw, Theodore Seymour, L. M. Schmidt, J. S. Stanton, Isaac Sonnenberg, Emil Schilling, F. B. Simpson, F. M. Sinclair, Herman Stursburg, Jonas Sonneborn, Solomon S. Sonneborn, J. M. Sowers, J. W. Spencer, Joseph Schlessinger, Emil Schalk, Alex. Strauss, C. C. Selden, Rudolph Schalk, Ed Sohns, John C. Seager,

L. F. Sadler, S. G. Slike, T. W. Strong, Jr., J. E. Seaver, W. G. Sewell, O. F. Schonblom, P. J. Sweeney, C. F. Schramme, J. F. Stovekin, A. B. Smith, A. E. Sengestack, F. L. Tapscott, W. H. Truman, George W. Thumm, C. F. Thumm, Charles B. Taintor, J. H. Telfair, John H. Trenken, Charles H. Talmage, E. R. Thompson, Karl Thalman, F. Alberding, K. Thym, G. Clarence Taylor, Otto Thurkauf, Edwin Tatham, C. Tobias, M. M. Truman, H. H. Truman, George L. Upshur, Ogden H. Vail, C. H. Wilcox, H. R. Wilcox, E. K. Willard, Bellinger White, J. T. Winchester, Benjamin C. Williams, M. J. Waters, Maurice T. Ward, Charles L. Wright, Charles Allison Walsh, Charles George Wilson, John D. Wing, C. F. Willard, J. Morgan Wing, Thomas Wilson, E. H. Woeltze, J. C. Welch, Alfred Waldsen, C. G. White, J. Duff Wallace, L. P. Wiegman, A. B. Walker, M. Whitfield, C. S. Whitney, George B. Walter, Charles Wolf, F. A. Willark, Jackson Wallace, B. J. Wenberg, John Wheeler, R. Wischer, R. J .G. Wood, Charles G. Wolff, Ed S. Worthington, Oscar Yenni, Charles F. Yenkes, Jr., C. C. Marvin, E. C. Minzesheimer, F. L. Talcott, Jr., W. H. McCormack, E. B. Havens, W. J. Oliphant, H. Marsh, Charles Schleiter, Charles C. Allen, H. C. Howell, Charles Davison, A. F. Young, S. M. Bogert, Ed G. Leszynsky, Charles A. Troup, S. H. Leszynsky, W. S. Hart, L. G. Dempsey, A. S. Fishblatt, J. D. Balch, H. A. Tewkesburg, George Y. Brown, E. J. Olmsted, John Meyer, William McGibbon, Richard Wolff, Joseph A. Hutry, G. A. Beling, Jr., Henry Siebert, Frank Platt, Oscar B. Linder, Alfred J. Luders, James W. Murphy, E. B. Shafar, H. Hooper, H. A. Groesbeck, A. Obrig, A. Rich, Charles E. Obrig, A. Banks, G. W. B. Dakin, William Stake, William C. Rose, W. H. Turner, G. L. Mordecai, W. E. Banks, E. Pfarius, W. G. Young, Otto Korneman, C. P. Kelterer, G. W. Bond, William P. Burnham, Albert S. Odell, Carl de La Barrs, Aug. Stamm, Theodore H. Armstrong, Orlando M. Bogert, Lewis J. Weil, W. H. Henriques, Robt. T. Hoy, Theo. W. Myers, F. R. Fisk, J. E. Fairchild, S. H. Parsons, Henry W. Reighley, Chas. Blizard, J. W. Cronkite, Edwin R. Neeley, H. B. Carples, W. F. Holwell, J. V. Higgins, Albert E. Parker, G. Kutz, John Schramm, Henry Bear, Max Sax, R. Salombier, A. W. Town, B. K. Stevens, John R. Andrews, G. Slocovich, W. W. Wendler, Geo. M. Porter, T. H. Talcott, E. P. Selmser, Wm. Willis Merrill, Com. A. Mahoney, Frank W. Norris, D. S. Willard, T. B. A. Trotter, A. D. Snow, E. S. Peak, C. A. Kimball, W. H. Kimball, W. A. Johnston, F. V. R. Gaudil, F. B. Squire, B. A. Trowbridge, George H. Hogan, J. S. Cowles, Joseph Pode, F. C. Markham, Alfred F. Hennings, F. Olney Hill, S. B. Wellington, J. A. Brown, A. S. Rosenbaum, Samuel Offenheiser, James A. Marcus, Effingham Lawrence, W. F. Randolph, S. J. Harrison, W. F. Owens, J. L. Maas, H. M. Smith, W .C. North, Oscar Meier, M. B. Butler, J. S. Bach.

NEW YORK PETROLEUM EXCHANGE, 18 BROADWAY, NEW YORK.

(ORGANIZED APRIL 12, 1877.)

Proceedings of the annual meeting May 6, 1884; also rules of the exchange, by-laws and lists of its officers and members. Seventh annual report, May 6, 1884.

The eighth annual meeting of the New York Petroleum Exchange was held in the exchange, 18 Broadway, New York, May 6, 1884, in conformity with Article IV., Section I., of the by-laws. President L. H. Smith called the meeting to order at 12 30 p. m.

Officers: L. H. Smith, President; James A. Waugh, First Vice President; S. F. Strong, Second Vice President; H. M. Curtis, Treasurer; W. H. Lewis, Secretary. Directors: P. V. Miller, Livingston Roe, H. O. Beebe, H. E. Hosford, Minot Mitchell, Samuel Ames, Nic Mehlen, M. A. Winkle, Frank Tack, Marshall Ayres, Jr., H. S. Corwin, P. B. Crosby, H. A. Patterson, J. W. Copmann, C. E. Orvis, F. D. Stead, W. G. Young, G. H. Lincoln, Marcus Heim, James P. Moore.

Standing Committees, 1884—Finance: C. E. Orvis, Chairman; George H. Lincoln, H. S. Corwin. Floor: Nic Mehlen, Chairman; M. N. Day, M. Heim, S. F. Strong, G. M. Loederer, F. H. Skelding. Conference: Nic Mehlen, Chairman; Frank Tack, P. B. Crosby. Clearing-house: S. F. Strong, Chairman; H. A. Patterson, Frank Tack. Law: S. F. Strong, Chairman; S. C. T. Dodd, N. P. Stanton. Complaint: P. V. C. Miller, Chairman; Livingston Roe, H. E. Hasford.

LIST OF MEMBERS.

A.

No.	Name.	Address.	Company or Firm.
88	C. F. Ackermann,	27 and 28 Beaver St.,	Meissner, Ackermann & Co.
111	Fred T. Ackermann,	27 and 28 Beaver St.,	Meissnes, Ackermann & Co.
227	Judah L. Adler,	526 Broadway.	
472	J. W. Alexander,	311 West 55th St.	
220	Harry Allen,	62 Broadway,	Allen & Stead.
299	Henry Allen,	70 Broadway,	Henry Allen & Co.
334	Samuel Ames,	18 Broadway,	Hilton & Waugh.
67	James Ames,	Buffalo, N. Y.	
364	Wm. H. Anderson,	18 Broadway.	
147	Frank W. Angel,	56 Wall St.	
85	John D. Archbold,	44 Broadway,	Acme Oil Co.
455	T. H. Armstrong,	Weehawken ,N. J.,	Weehawken Oil Docks.
12	Eli W. Arnold,	18 Broadway.	
76	M. Arnold,	18 Broadway.	
583	Simon W. Arnold,	24 State St.	
586	B. Arnson,	14 Cedar St.,	Arnson & Co.
421	W. S. Arter,	18 Broadway,	C. C. Beggs & Co.

475 Thomas J. Aspell, 42 New St.
9 J. M. Atwater, 37 Pearl St.
123 Marshall Ayres, Jr., 34 Broadway.

B.

259 F. G. Babcock, Hornellsville, N. Y., Bank of Hornellsville.
109 Paul Babcock, Jr., 44 Broadway, Sone & Fleming Manufacturing Co.
24 W. Babcock, 54 Broad St., Room 4, Babcock & Cox.
402 Roger S. Bacon, 30 Pine St., Orvis Bros. & Co.
94 C. W. Baker, 18 Broadway, J. C. Fisher & Co.
340 Geo. Bancroft, 55 Stone St., Small & Bancroft.
671 J. B. Barbour, Jr., 18 Broadway, James S. McKelvey.
99 E. H. Barnum, Bradford, Pa.
663 John R. Barrett, 125 Pearl St.
480 John M. Battle, 2 Stone St., Room 50.
14 Frederick F. Beals, 55 Broadway, Room 6.
36 O. H. Beebe, 32 Broad St., Van Schaick & Co.
385 Chas. W. Beebe, 18 Broadway.
433 LeGrand E. Beers, corner Washington and Flushing avenues.
330 G. A. Beling, Jr., 81 New St.
688 Geo. A. Bergmann, 30 Platt St., Geo. A. Bergmann & Co.
10 Irv. S. Bernheimer, 52 Broadway, Bernheimer & Spyr.
386 J. A. Berrian, Jr., 23 Beaver St., Geo. H. Lincoln.
640 M. K. Bettis, Oil City, Pa.
614 David Bettman, 121 East Sixtieth St.
476 J. M. Bettman, 18 Broadway, Room 813.
521 M. A. Bettman, 75 and 77 Leonard St.
51 James M. Bingham, Twelfth and Pike Sts., Pittsburg, Pa.
465 Emmett Birdsall, C. 2 Exchange Ct., and 52 Broadway.
47 J. M. Bishop, 867 Case ave., Cleveland, O.
684 H. L. Blackmarr, Bradford, Pa.
219 Joseph A. Blair, 78 and 80 Broadway.
416 Allen R. Blount, corner Stone and Whitehall Sts.
305 H. W. Blakeslee, 18 Broadway.
552 E. W. Bliss, 17 Adams St., Brooklyn, N. Y.
52 F. E. Boden, Bradford, Pa.
239 D. Bolard, Oil City, Pa.
449 J. N. Bolard, Bradford, Pa.
649 John M. Bonham, Pittsburg, Pa.
613 Frank P. Bool, Jr., 40 New St., Ryerson & Bool.
25 J. A. Bostwick, 44 Broadway, Standard Oil Co.
308 C. H. Bourne, 18 Broadway, Wm. G. Young & Co.
172 Thomas B. Bowring, 39 Broadway, Bowring & Archbold.
116 James R. Boyd, 3 William St., Boyd & Hincken.
630 E. C. Bradley, Bradford, Pa.
105 Benj. Brewster, 44 Broadway, Standard Oil Co.
62 C. L. Brodt, 18 Broadway.
620 C. A. Brown, 115 Broadway, Room 119.
174 S. D. Brown, Third and Walnut Sts., Philadelphia, Pa., Tidewater Pipe Line Co.
606 T. Browne, Stockton.
43 W. K. Browne, 43 Kilby St., Boston, Mass.
359 Ed. H. Brownell, 169 Front St.
266 Phil. Bruns, 18 New St.
676 John B. Bryan, Pittsburg, Pa., Sproul & Bryan.
338 J. Buckley, 401 Broadway, Erie R. R.
549 J. T. Budd, 8 E. Seneca St., Buffalo, N. Y.
367 Theo. A. Bulkley, 89 Fulton St.
595 Arch. H. Bull, 32 South St.
575 Geo. T. Bunker, 81 New St., Bunker & Jones.
232 H. H. Bunnell, 64 Broadway.
578 T. H. Burch, M. D., 1 South Fifth ave.
500 R. W. Burke, 128 Pearl St., Queens Co. Oil Works.
264 J. W. Burnham, 36 Broad St.
4 Ira Bursley, 64 South St.
600 C. W. Burton, 76 Pine St.
674 Chas. D. Burwell, 60 Broadway.
89 C. J. Bushnell, 35 Broadway, Bushnell & Co.
628 C. S. Bushnell, 35 Broadway, Bushnell & Co.
584 Frank C. Bushnell, New Haven, Conn.
341 Joseph Bushnell, 44 Broadway, Standard Oil Co.
197 T. C. Bushnell, 44 Broadway, Standard Oil Co.
661 J. E. Butler, Oil City, Pa., J. E. Butler & Co.
295 M. J. Buxbaum, 3 and 5 Thomas St.
488 Wm. A. Byers, 22 Cortlandt St.
347 Edgerton Bymer, 88 Liberty St., Dilks Oil Co.
544 Edward F. Byrne, 54 Cliff St.
371 H. J. Byrne, 66 New St.

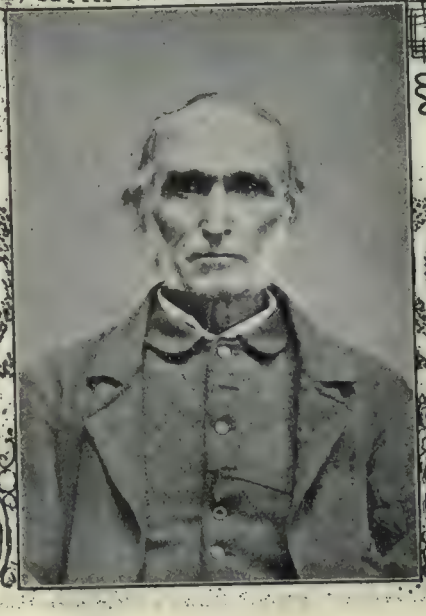
C.

639 J. A. Cadwallader, Titusville, Pa., Anchor Oil Co.
503 Addison Cammack, 34 Broad St.
508 Geo. W. Campen, 18 Broadway, Room 405.
682 J. R. Campbell, Oil City, Pa., United Pipe Lines.
505 Thos. M. Carlisle, 338 Washington St., Adams & Howe.
461 G. F. Carll, 18 Broadway.
459 James M. Carney, Room 417, New Produce Exchange.
169 John J. Carter, Titusville, Pa.
333 H. P. Chamberlain, Titusville, Pa.
81 J. C. Chambers, Olean ,N. Y.
672 W. H. D. Chapin, Bradford, Pa.
657 Geo. A. Chapman, 101 Pearl St.
502 R. P. Charles ,13 South William St.
681 G. K. Chase, 12 Bridge St.
33 H. D. Chase, 12 Bridge St.
234 W. F. Chittendon, 46 Exchange Place.
291 H. S. Church, 54 Broadway.
318 Richard Church, Belvedere, Alleg. Co., N. Y.
32 Frank E. Clark, 18 Broadway.
327 N. F. Clark, Oil City, Pa., Box 605, Clark & Foster.
473 A. T. S. Clark, 56 Pine St.
484 C. H. Cleland, 18 Broadway.
202 Harold Clemens, 18 Broadway, Harold Clemens & Co.
507 Byron A. Cohen, 120 Broadway.
177 Herman Cohen, 52 Broadway.

INDEPENDENT OIL REFINERIES, WARREN, PA.



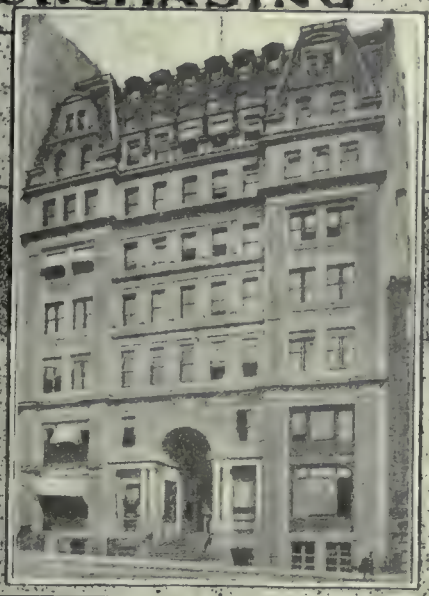
NATHANIEL CARY, OF OIL CREEK, PA, ON HIS FIRST TRIP TO PITTSBURG, WITH A LOAD OF SENECA OIL IN 1806.



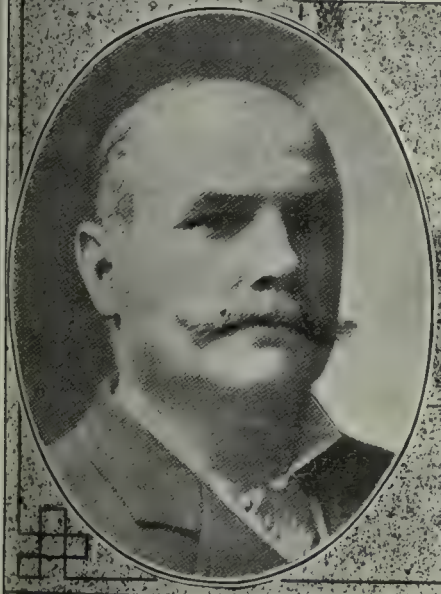
JAMES EVANS

PIONEER DRILLER AND OPERATOR IN THE WORLD FAMOUS LUBRICATING OIL FIELD AT FRANKLIN PA.

SEEP PURCHASING AGENCY



SEABOARD NATIONAL BANK NEW YORK, STANDARD OIL BANK



SAMUEL GAMBLE BAYNE
PRESIDENT SEABOARD NAT'L BANK, NEW YORK



JOSEPH SEEP
CRUDE OIL PURCHASING AGT STANDARD OIL CO



JAMES STILLMAN
PREST CITY NAT'L BANK N.Y. STANDARD OIL BANK

JOSEPH SEEP

SEABOARD NATIONAL BANK. OF NEW YORK No 1000

OIL CITY, PA. Dec 15" 1904

Pay to the order of John Manning

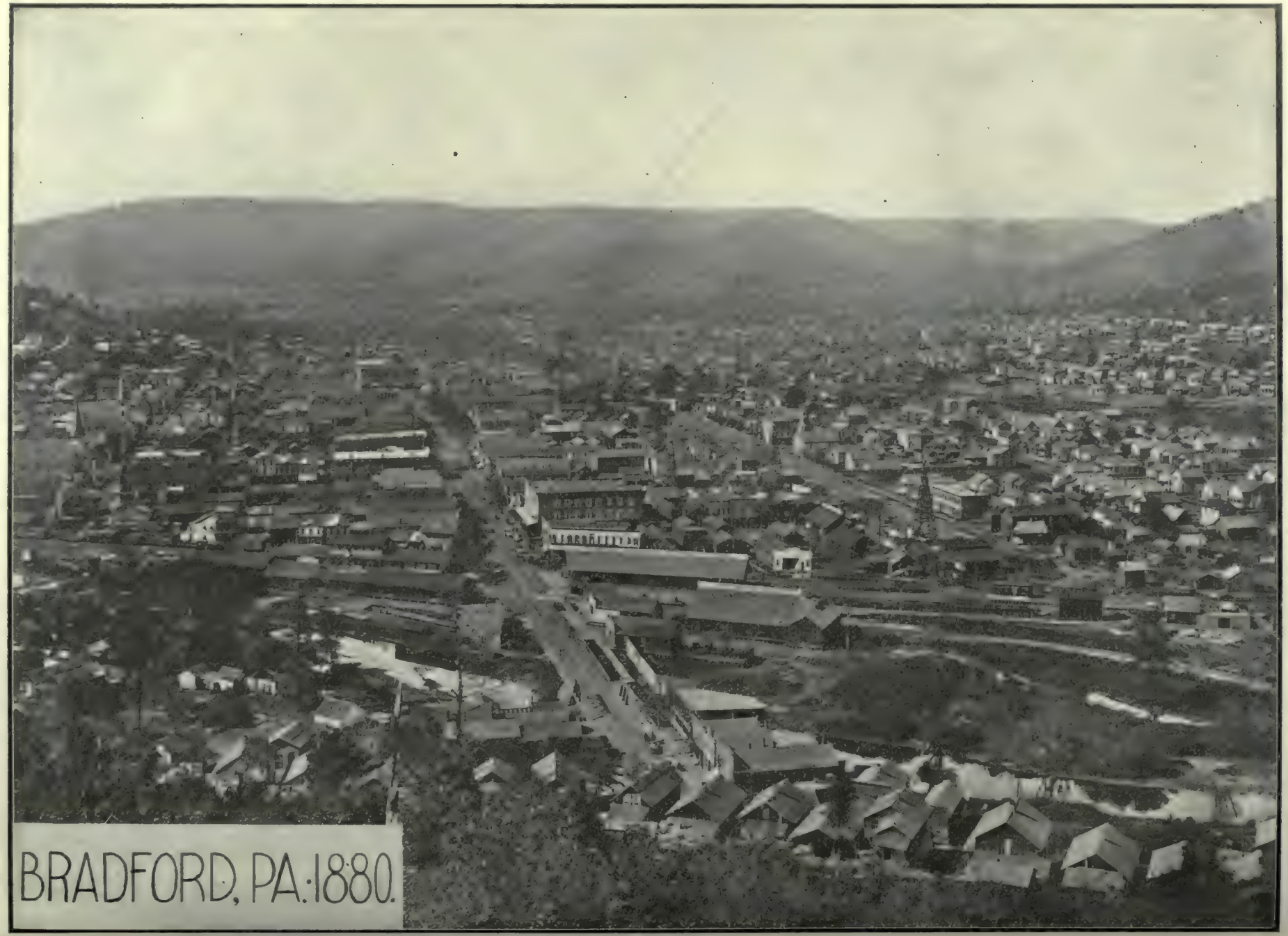
Two hundred dollars and fifty cents $200.50

Joseph Seep

SEEP PURCHASING AGENCY



BRADFORD OIL EXCHANGE, BRADFORD, PA.



BRADFORD, PA. 1880.



OIL SCOUTS

AT PHILLIPS BROTHERS SCHOOL HOUSE WELL NO. 1, JUNE, 1884, THORN CREEK BUTLER CO., Pa.

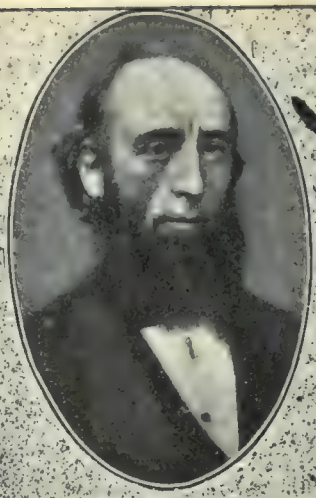


OIL DIPPERS
MILLER'S FARM, OIL CREEK, 1862.


ABBOTT & HARLEY PIPE LINE
SHAFFER FARM, OIL CREEK, PA. 1865.



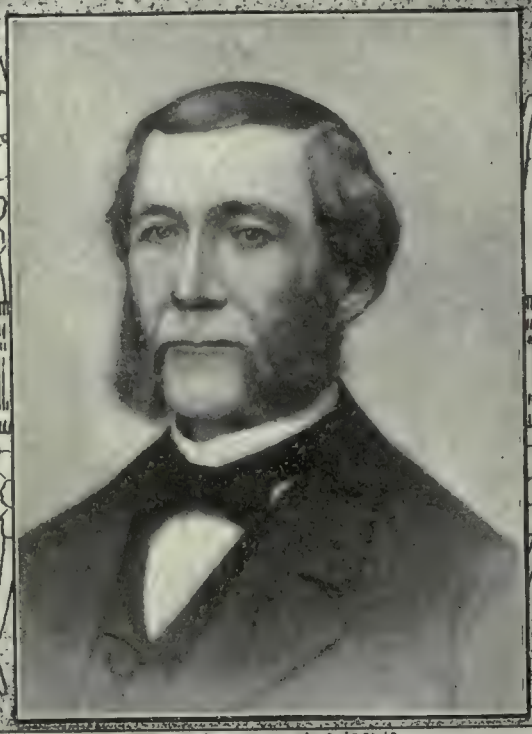
SHIPPING OIL FROM THE
STORY FARM, OIL CREEK 1863.



WILLIAM H ABBOTT
ABBOTT & HARLEY PIPE LINE



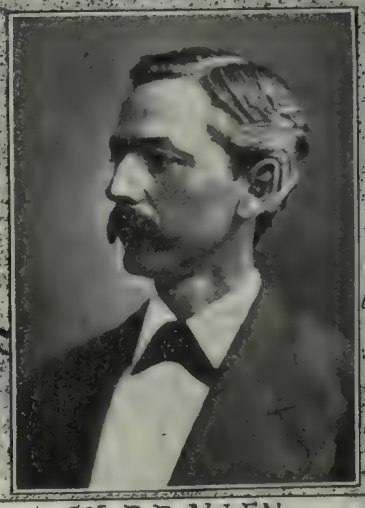
STEPHEN DUNCAN KARNS
PRESIDENT KARNS PIPE LINE



SAMUEL VAN SYCKEL
BUILDER OF THE FIRST SUCCESSFUL OIL PIPE LINE



HENRY HARLEY
ABBOTT & HARLEY PIPE LINE



COL. R. B ALLEN
PRESIDENT OF THE GRANT PIPE LINE



JOHN J. FISHER
OIL MERCHANT



FREDERICK FISHER
OIL MERCHANT



HENRY FISHER
OIL MERCHANT



THE LATE CAPT J. J. VANDERGRIFT
EX-PRESIDENT OF THE
UNITED PIPE LINES



GEORGE V. FORMAN
OF THE VANDERGRIFT & FORMAN
PIPE LINES



J. R. CAMPBELL
EX-TREASURER OF THE
UNITED PIPE LINES



THE LATE COL. JOS. D. POTTS
EX-PRESIDENT OF THE
EMPIRE TRANSPORTATION CO



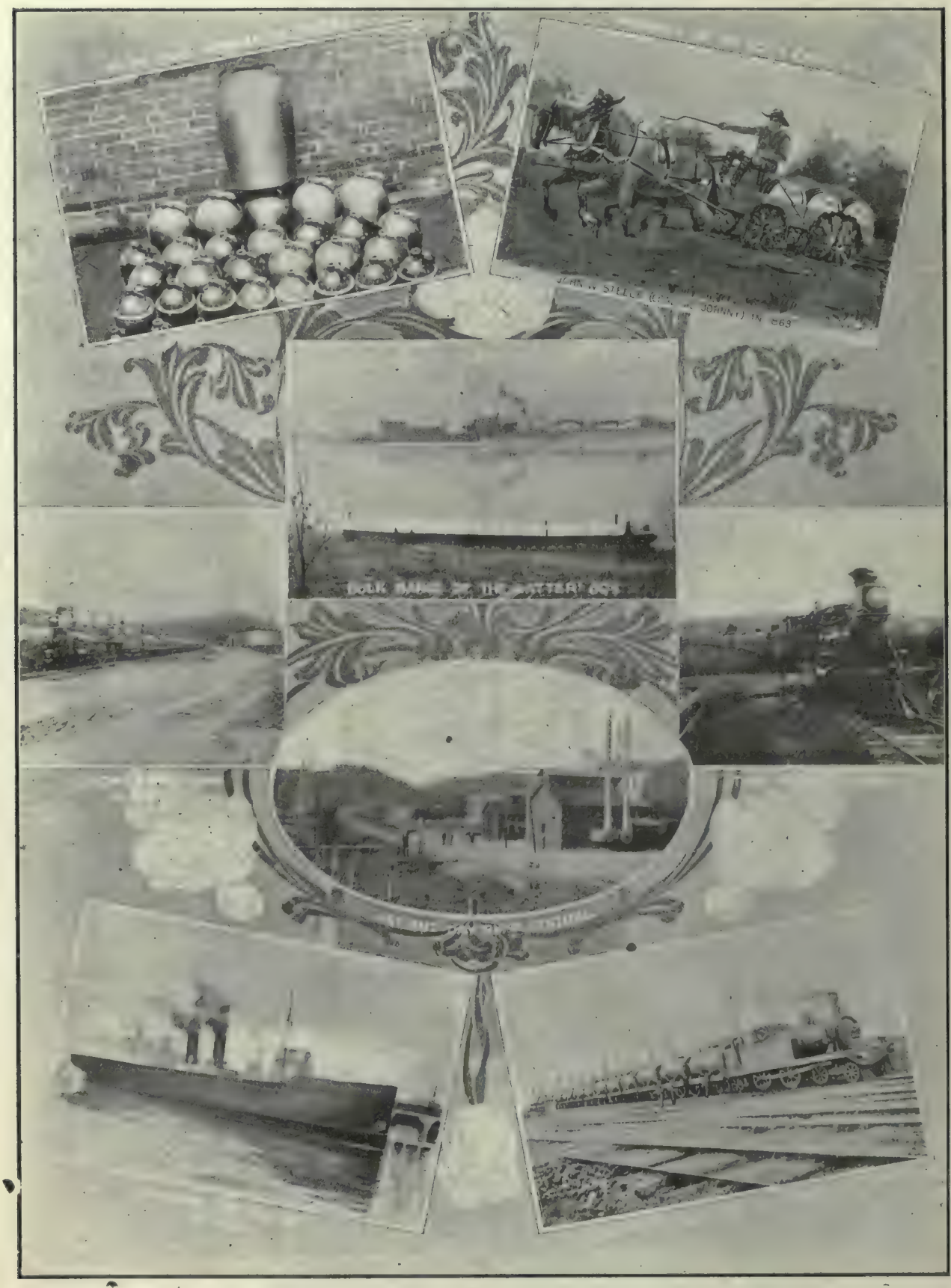
EDWARD HOPKINS
MANAGER OF THE
UNITED PIPE LINES.



SHIPPING OIL AT THE MOUTH OF OIL CREEK
ON THE ALLEGANY RIVER AT OIL CITY, PA.
1863.



POMEROYS OIL CREEK BOAT EXPRESS. FARE $3.00 FROM SHAFFER FARM TO OIL CITY 1864.



258 F. H. Cohn, 8 Wall St.
279 Rod. G. Collins, Oil City, Pa., Hukill & Collins.
159 Sheldon Collins, 25 Pine St.
179 Charles H .T. Collis, 138 So. Third St., Philadelphia, Pa.
72 A. T. Comer, 18 Broadway.
689 S. Comfort, 44 Broadway.
163 Fred Conlin, 18 Broadway Central Refining Co.
303 John Connor, Oil City, Pa.
351 Herman A. Cook, 979 First ave.
482 Alexander Cook, 382 Water St.
667 Geo. N. Coombs, 18 Broadway.
137 Wm. H. Coon, 26 Beaver St., H. M. Curtis & Co.
6 J. W. Capmann, 22 Beaver St.
399 H. S. Corwin, 81 New St.
611 John C. Crevier, 24 Newark St., Hoboken, N. J.
132 Theo. Crohn, 18 Broadway.
558 Geo. W. Caster, 18 Broadway, Smith & Crosby.
353 Henry Cranston, 721 Broadway.
363 J. W. Cronkite, 18 Broadway.
97 P. B. Crosby, 18 Broadway, Smith & Crosby.
470 A. L. Crowell, 46 Water St.
183 Chester E. Crowell, 23 Beaver St.
481 Joseph H. Cunningham, 18 Broadway.
8 H. M. Curtis, 26 Beaver St., H. M. Curtis & Co.
428 C. S. Curtiss, 614 Willoughby ave., Brooklyn, N. Y.
439 P. J. Cuskley, 73 South St.

D.

306 F. A. Dailey, Bradford, Pa.
485 George H. Daily, 19 Old Slip, Daily & Panken.
315 Reuben Daniell, 18 Broadway.
64 Geo. W. Darr, Oil City, Pa., Heard & Darr.
647 F. Dassori, 33 South William St.
468 F. S. Davis, 16 Exchange Place.
30 Geo. W. Davis, 13 New St.
325 John S. Davis, Merchants Exchange, Philadelphia, Pa.
19 M. N .Day, 22 Beaver St.
7 Rowland De Boate, N. Y. Stock Exchange.
615 A. De Comeau, 98 Green St., O. & A. De Comeau.
547 U. De Comeau, 98 Green St.
372 Aaron De Cordova, 38 Broad St.
390 E. De Cordova, 38 Broad St.
412 N. De Goicuria, 263 West Forty-fifth St.
54 J. A. De Hoog, 22 Beaver St., J. W. Copmann.
642 H. S. Dellegar, 18 Broadway, H. A. Patterson.
566 F. Percy De Velasco, 18 Broadway.
585 James D. Dewell, New Haven, Conn.
627 George Dick, 20 Coenties Slip.
114 Samuel B. Dick, Meadville, Pa., J. R. Dick & Co.
46 Peter Diestel, 20 John St., John A. Maass & Co.
166 W. M .Diestel, 48 Cedar St.
536 H. E. Dillingham, 72 Broadway.
603 DeWitt Dilworth, 83 Wood St., Pittsburg, Pa.
246 S. M. Dittman, 114 Pearl St., Dittman & Uhlfelder.
588 B. W. Dixon, 18 Broadway, H. A. Patterson.
66 Chas. F. Doane, 18 Broadway.
514 Geo. A. Doane, Jr., 28 State St., Boston, Mass., Evans & Doane.
13 S. C. T. Dodd ,44 Broadway, Standard Oil Co.
492 Henry P. Doremus, 196 Broadway, Chatham National Bank.
119 Wm. L. Doremus, 18 Broadway.
352 Thos. Dorsey, Millerstown, Pa.
128 James Duffy, 74 Beaver St.
346 W. H. Dufur, Oil City, Pa.

E.

200 C. M. Eaton, 18 Broadway.
329 John Eaton, Bradford, Pa., Oil Well Supply Co.
269 O. P. Edgerton, 18 Broadway.
424 Judson Edgett, 66 New St., John Parker & Co.
287 A. L. Egbert, 18 Broadway, Egbert & Ockershausen.
373 F. Eggena, 18 Broadway.
562 Wm. Englehardt, 18 Broadway.
60 H. K. Enos, 31 and 33 Broad St.
250 W. M. Este, 18 Broadway.
161 Wm. G. Evans, Bradford, Pa.

F.

201 Henry L. Faris, 25 New St., H. T. Godet & Co.
419 F. A. Farley, Jr., 81 New St., Skelding & Farley.
120 S. A. Fatman, 53 Beaver St., Walter & Krohn.
164 J. W. Fellows, 17 Wall St., E. H. Herriman & Co.
58 B. F. Fielding, 1 South William St.
324 Benj. Fisher, 18 Broadway.
571 Fred Fisher, 18 Broadway.
129 Henry Fisher, 44 Broadway, Acme Oil Co.
360 Henry Fisher, Pittsburg, Pa., J. C. Fisher & Co.
22 W. Fisher, 18 Broadway.
370 Wm. L. Flake, 18 Broadway.
59 H. Fleming, 18 Broadway, Central Refining Co.
155 Anson R. Flower, 52 Broadway, R. P. Flower & Co.
275 Frederick S. Flower, 22 Broadway, R. P. Flower & Co.
272 John S. Flower, 12 Broadway, R. P. Flower & Co.
73 G. Folke, 18 Broadway.
694 Geo. V. Forman, Olean, N. Y.
225 Charles Forster, 898 Third ave.
267 F. B. Foster, 226 Walnut St., Philadelphia, Pa.
342 G. E. Foster, Oil City, Pa., Clark & Foster.
626 W. H. Fountain, 14 Stone St.
666 Harry Frank, 411 Broadway.
251 Chas. J. Fraser, Oil City, Pa.
467 T. W. French, 42 New St.
212 C. French, Jr., 55 Broadway, W. H. Johnson.
669 Wm. R. French, 18 Broadway.
533 H. Friedrichs, 18 Broadway.
249 Orrin C. Frost, Mills Building.
260 H. P. Frothingham, 2 Wall St.
660 J. M. Fuller, Bradford, Pa., Bayne, Fuller & Co.
168 A. P. Frank, 18 Broadway, Harold Clemens & Co.

G.

560 L. Gans, Jr., 23 Thomas St.
425 E. R. Gasper, Pittsburg, Pa.
632 M. C. Gasper, 54 South St., Howland & Aspinvall.
498 Wm. Gaston, 24 Commerce St., Newark, N. J.
358 Albert Gergonne, 103 William St.
139 Wm. L. Gerrish, 314 Broadway, R. G. Dun & Co.
214 Geo. R. Gibson, 49 Broadway, Watson & Gibson.
274 J. W. N. Gilds, 44 Broadway, United Pipe Lines.
644 C. W. Gilleatt, 66 New St.
555 A. Goepel, 68 Broad St., Goepel & Trube.
40 D. Goettel, Oil City, Pa.
510 Samuel Goldberg, 18 Broadway.
173 J. Goldsmith ,85 Liberty St.
540 Wm. W. Goodrich, 59 Wall St., Goodrich & Co.
217 A. S. Gorham, 32 Broad St.
290 A. W. Gorsline, 60 Broadway, C. H. Badeau.
312 C. H. Gastenhofer, 88 Wall St., J. L. Phipps & Co.
144 Chas. Graef, 23 Beaver St.
255 John H. Gray, 24 New St.
309 Warren G. Gray, Bradford, Pa., Lock Box 1186.
263 F. W. Gregory, 6 Barrow St.
143 Geo. F. Gregory, 44 Broadway.
654 F. L. Guenther, 18 Broadway, Seaboard Bank.
213 J. Gutman, 2 New St.
281 Nicholas Gwynn, 16 Exchange Place, Fielding & Gwynn.

H.

130 K. Haas, 126 Front St., Haas Bros.
542 Theodore Haight, 81 New St., Hasford & Haight.
506 John H. Haines, 24 Merchants Exchange, Boston, Mass.
216 Nymphus C. Hall, 2 Coenties Slip.
523 W. T. Hall, 60 Broadway, Room 17.
34 Joseph W. Halk, 18 Broadway.
86 John A. Halsey, 115 Broadway.
636 John E. Haner, 18 Broadway.
437 R. J. Hanna, Oil City, Pa.
463 C. G. Harmon, Corry, Pa., Corry Nat. Bank.
523 R. A. Harrison, 18 Broadway, Norton & Harrison.
252 Thos. D. Harrison, 26 Water St.
136 J. E. Haskell, Bradford, Pa.
668 G. L. Hassel, 5 New St., W. C. Dorin & Co.
638 Rufus Hatch, 55 Broadway, Rufus Hatch & Co.
270 A. G. Hatry, Lewis Block, Pittsburg, Pa.
569 Edwin A. Hatry, 23 Beaver St.
478 Joseph A. Hatry, 32 Platt St.
466 J. Havemeyer, 17 Platt St.
228 Geo. Heard, Oil City, Pa.
494 Francis H. Hearn, 737 Broadway.
561 F. E. Heath, 65 Fourth aye., Pittsburg, Pa.
616 Wm. Heckman, Meadville, Pa.
286 Marcus Heim, 81 New St.
429 W. H. Heiss, 62 Broadway.
210 J. J. Hendricks, Oil City, Pa., Hendricks & McLaughlin.
605 Max Herrmann, 80 Pearl St.
405 Isaac H. Herts, 806 Broadway, Herts Brothers.
158 E. C. Hertzel, 18 Broadway.
431 C. R .Hickox, 36 Whitehall St.
404 H. S. Hill, 59 Fourth Ave., Pittsburg, Pa., Watson & Hill.
63 N. F. Hilton, Oil City, Pa., Hilton & Waugh.
256 N. W. H. Hix, 18 Broadway.
447 Edward C. Hodges, 28 State St., Boston, Mass.
326 Charles B. Hogg, 124 Maiden Lane.
419 E. C. Holdbrook, 72 Broadway.
68 H. H. Hohorst, 18 Broadway.
448 Geo. B. Hopkins, 72 Broadway, E. K. Willard & Co.
440 R. E. Hopkins, Titusville, Pa., Tidewater Pipe Co., Ltd.
559 G. L. Hoppenstedt, 21 Nassau St., H. Amy & Co.
292 H. L. Horton, 54 Broadway, H. L. Horton & Co.
637 H. E .Hasford, 81 New St., Hasford & Haight.
293 E. A. Houard, 731 Spruce St., Philadelphia, Pa.
597 W. J. Howard, 11 South St., Peter I. Nevins & Son.
103 Geo. C. Howe, Bradford, Pa.
300 Chas. H. Hoyt, 31 Broad St., C. H. Hoyt & Co.
486 S. T. Hubbard, Jr., 9 South William St.
253 Rud Huben, 18 Broadway, N. Y. Petroleum Ex.
1 P. Buch, 43 Exchange Place.
268 Geo. P. Hukill, Oil City, Pa., Hukill & Collins.
134 J. W. Humphrey, Jr., Bradford, Pa., Humphrey & Pierce.
182 B. N. Hurd, Fayetteville, N. Y., Carter & Hurd.
271 W. J. Hutchinson, 56 Broadway.
550 F. A. Hyland, 18 Broadway.
624 Samuel Hyman, 35 Broad St., Scholle Bros.

I.

426 Wm. Jay Ives, 52 Broad St.

J.

451 E. A. Jacob, 320 Broadway.
685 W .D. Jaffray, 3 William St.
675 Julius Jahn, 30 New St.
563 Gerhard Janssen, 68 Broad St., Janssen & Co.
387 L. H. Janvrin, Albemarle Hotel.
298 J. B. Jayne, Bradford, Pa.
695 K. K. Jenkins, 65 Broadway.
368 E. W. Jewett, 24 Broad St.
693 E. T. Johnson, Bradford, Pa., Johnson & Co.
150 Geo. F. Johnson, 120 Broadway.
91 W. H. Johnson, 55 Broadway, Room 6.
148 J. R. Johnston, Fifth Ave. and Wood St., Pittsburg, Pa.
145 Alex. Johnstone, 52 Exchange Place.
294 A. S. Jones, 51 New St.
53 J. T. Jones, Bradford, Pa., Bradford Oil Co.
602 James W. Jones, 81 New St., Bunker & Jones.
240 S. Arthur Joseph, 4 Broad St.
441 Laurens Joseph, N. Y. Stock Exchange.

444 P. H. Judd, Oil City, Pa., H. Lewis & Co.
576 Chas. G. Judson, 73 Leonard St.

K.

496 John L. Kahl, 69 William St.
548 H. M. Kaminski, 644 Broadway.
460 J. H. Kastor, 18 Broadway.
232 M. Kaufmann, 309 West St.
641 J. B. Kearney, 104 Wall St.
70 R. M. Kennedy, Pittsburg, Pa., Kennedy & Co.
192 E. W. Ketcham, 96 Beekman St.
3 Frank Kimball, 18 Broadway.
180 R. J. Kimball, 18 Wall St., R. J. Kimball & Co.
125 Hugh King, 18 Broadway, McGoey & King.
122 A. L. Kinkead, 18 Broadway.
287 C. G. Kinkel, 97 Water St.
497 E. Kirsten, 18 Broadway.
226 Charles Knowd, 18 Broadway.
61 J. W. Krafft, 73 Pine St.
74 Jean P. Kraner, 18 Broadway.
277 Gabriel S. Kutz, 992 Wall St., Kutz & Co.

L.

621 Bernard Lande, 18 Broadway.
519 Wm. E. Lane, 130 Pearl St.
464 S. Lansburgh, 26 Broad St.
50 R. Lauer, 34 Cedar St.
531 Moses Lauterbach, 40 Broad St.
348 W. A. Lawrence, 18 Broadway.
572 Chas. R. Leaycraft, 142 Pearl St., Leaycraft & Co.
573 J. Leaycraft, 142 Pearl St., Leaycraft, & Co.
206 Geo. M. Lederer, 18 Broadway.
679 R. H. Lee, Buffalo, N. Y.
339 John T. Lee, 18 New St.
604 Chas. S. Laute, 303 State St., New Haven, Conn.
543 R. L. Leggett, 30 Broad St.
209 Philip Lehman, 40 Exchange Place.
301 Elkan Leipziger, 40 Broad St.
297 Geo. W. Lessels, 44 Broadway, Standard Oil Co.
376 J. T. Lester, Chicago, J. T. Lester & Co.
608 Sam H. Leszynsky, 21 Beaver St.
567 J. H. Leverich, 31 Wall St.
369 S. L. Levy, 138 S. Third St., Philadelphia, Pa., Collis & Levy.
483 Frederic E. Lewis, 81 New St.
443 Geo. Lewis, Oil City, Pa., H. Lewis & Co.
435 Henry Lewis, Oil City, Pa., H. Lewis & Co.
307 W. H. Lewis, 18 Broadway, N. Y. Petr. Exc.
525 Frank A. Liftchild, 26 Broad St.
495 G. H. Liftchild, 25 New St.
141 Louis A. Lienau, 107 Front St.
2 Geo. H. Lincoln, 23 Beaver St.
664 Chas. P. Lineback, 18 Broadway.
450 Joseph Lockitt, Patchague ,N. Y.
149 F. W. Lockwood, 26 Beaver St.
322 Wm. A. Lockwood, Norwalk, Conn.
686 A. H. Logan, 319 Walnut St., Philadelphia, Pa., Logan, Emery & Weaver.
102 Willy Loeb, 18 Broadway.
75 J. Lombard, 34 Broadway, Lombard, Ayres & Co.
635 J. H. Longstreet, 9 Barclay St.
321 D. W. Longwell, Bradford, Pa.
446 W. H. Longwell, Oil City, Pa.
243 Barney Lowentritt, Oil City, Pa.
288 A. L. Lowrie, 18 Broadway.
520 Alfred J. Luce, 59 Pearl St., A. Luce & Co.
651 D. J. Ludwig, 197 Broadway.
692 Lee A. Lyman, 113 Fourth Ave., Pittsburg, Pa.
131 D. W. Lynes, 23 Beaver St., Geo. H. Lincoln.

M.

515 J. L. McAulay, 16 Exchange Place, McAulay & Co.
345 R. Mackenzie, 83 Wood St., Pittsburg, Pa.
459 R. A. Macready, 69 Wall St., R. Macready & Co.
384 H. P. Malone, Bradford, Pa.
445 Joseph Manning, Oil City, Pa.
185 H. A. Marlin, Bradford, Pa., Marlin & Stephenson.
409 Thos. Marrin, 197 Broadway.
248 F. P. Marsh, 721 Broadway.
262 F. A. Marsily, 52 Broadway.
432 Geo. C. Martin, 18 Broadway.
21 J. J. Marvin, 52 Broadway.
374 Chas. A. Mathews, 5 Nassau St.
236 Carl Mayer, 112 Pearl St., Mayer Bros. & Co.
554 J. Mayer, 38 Broad St.
280 L. W. Mayer, 25 Nassau St.
237 William Mayer, 112 Pearl St., Mayer Bros. & Co.
244 S. L. Maxwell, Oil City, Pa.
499 H. R. McElligott, 42 New St.
311 Geo. L. McFarlane, 93 Fourth Ave., Pittsburg, Pa.
17 H. A. McGee, 52 Broad St., Livingston Roe.
319 W. S. McGhee, Warren, Pa., Box 183.
115 Thomas McGoey, 18 Broadway, McGoey & King.
474 G .G. McIntosh, 11 South St., Peter I. Nevins & Son.
194 T. A. McLaughlin, Oil City, Pa.
670 M. K. Mullin, Bradford, Pa.
388 W. C. McNish, Bradford, Pa.
650 W. J. McPherson, 31 Broad St., H. K. Enos & Co.
361 Ed. T. Mecham, Bradford, Pa.
16 Nic Mehlen, 18 Broadway.
417 O. Meier, 26 South William St.
135 Frederick Meissner, 29 Beaver St.
328 Louis Mendel, 24 Grove St., N. J. Nathan & Co.
323 Louis P. Mendham, 387 Broadway.
418 M. B. Mendham, 12 Bridge St.
538 A. G. Mercer, 52 Broadway, Owens & Mercer.
643 M. H. Mercer, Bradford, Pa.
108 Willis W. Merrill, Room 417 N. Y. Produce Bldg. Exchange.
186 Frederick Meyer, 15 Wall St., Raven & Co.
133 Wm. E. L. Meyer, 26 Beaver St.
477 Chas. J. Miller, 1 South William St.
442 H. W. Miller, 58 Broadway.

15 Pierce V. C. Miller, 18 Broadway, W. W. Miller & Bro.
35 W. W. Miller, 18 Broadway, W. W. Miller & Bro.
381 Geo. Millett, 62 Broadway.
574 L. R. Millikin, 43 New St., R. & C. Millikin.
379 S. M. Mills, 80 Broadway.
176 D. T. Millspaugh, 285 Ellison St., Paterson, N. J.
350 R. M. Miner, Phila. Petrol. and Min. Exc., Philadelphia, Pa.
278 Chas. Minzesheimer, 8 Wall St.
320 C. M. Minzesheimer, 8 Wall St.
49 M. Mitchell, 18 Broadway.
479 Fred Mohr, Jr., 44 Broadway, Acme Oil Co.
78 Clarence Moore, 13 Willoughby St., Brooklyn, N. Y.
211 James Moore, 65 Broadway, Am. Exp. Co.
665 James P. Moore, 61 Stone St.
69 R. J. Moorhead, 67 Fourth Ave., Pittsburg, Pa., Pinkerton & Moorhead.
377 Geo. B. Morgan, Bradford, Pa., Lock Box 1802.
422 D. R. Morrison, 155 Broadway.
430 M. H. Moses, 81 Vesey St., M. H. Moses & Co.
570 Harry W. Motley, 34 Wall St.
662 G. Muellierro, 132 Pearl St.
648 Alex. Munn, 3 Bowling Green.
526 H. G. Munn, Jr., 122 Pearl St., S. Munn Sons.
18 Michael Murphy, Warren, Pa., Davies & Murphy.
79 Benj. S. Musgrave, 55 Broadway.

N.

175 S. G. Nelson, 18 Broadway, Seaboard Bank.
596 J. F. Nevins, 81 New St., Peter I. Nevins & Son.
625 Peter I. Nevins, 11 South St., Peter I. Nevins & Son.
469 W. H. Nevins, 11 South St., Peter I. Nevins & Son.
38 Henry M. Newton, 88 Wall St.
276 W. W. Nicholas, Oil City, Pa.
222 W. H. Nicholson, Erie, Pa.
452 H. Niemeyer, 74 Broad St.
564 L. P. Norton, Bennington, Vt.
423 L. S. Norton, 18 Broadway, Norton & Harrison.

O.

551 M. J. O'Brien, 12 W. Twenty-third St., Southern Ex. Co.
343 Dan'l O'Day, Buffalo, N. Y.
203 G. F. Ockershausen, 18 Broadway.
87 D. R. Offley, 176 Fifth Ave.
179 R. S. Ogden, 83 Wood St., Pittbsurg, Pa.
518 W. M. Ogilvey, 70 Exchange Place.
41 H. C. Ohlen, 18 Broadway.
42 S. H. Ohlen, 18 Broadway.
273 Edw. L. Oppenheim, 51 New St.
187 Chas. E. Orvis, 30 Pine St., Orvis Bros. & Co.
254 Edwin W. Orvis, 30 Pine St., Orvis Bros. & Co.

P.

313 Pagenstetcher, 45 Beaver St.
504 J. C. Paine, 182 Front St., Penn. Oil Co. (Ltd.)
516 C. A. Palmer, St. John, N. Brunswick, Canada.
593 Frank S. Parker, 68 New St., J. W. Parker & Co.
646 Manton E. Parker ,58 Broadway.
162 Robert H. Parks, 13 New St.
436 L. O. Pattengall, 46 Water St.
285 H. A. Patterson, 18 Broadway, Room 606.
157 W. A. Patterson, 1 South William St.
607 E. B. Peck, Pittsburg, Pa.
427 Edward S. Peck, Patchague, N. Y.
284 A. W. Pfingsthorn, 81 New St.
380 Louis N. Phelps, 33 Broad St.
282 A. J. Phillips, 32 South William St.
283 M. B. Pierce, Bradford, Pa., Humphrey & Pierce.
396 S. S. Pinkerton, 67 Fourth Ave., Pittsburg, Pa.
617 John Pitcairn, Jr., Buffalo, N. Y.
20 E. Pitou, 15 State St., Room 34.
534 Geo. W. Piton, 52 Broad St., Livingston Roe.
138 Spire Piton, 15 State St., Room 34.
215 James D. Platt, 18 Broadway, Central Refining Co. (Ltd.)
152 Edward Pomeroy, 37 Pearl St.
487 Hiram Pool, 116 Pearl St.
539 H. B. Porter, Titusville, Pa.
683 R. H. McC. Potter, 86 South Fifth Ave., Potter & Co.
247 John K. Potts, Oil City, Pa.
84 A. J. Pouch, 44 Broadway, J. A. Bostwick.
199 Chas. Pratt, 46 Broadway, Chas. Pratt & Co.
655 E. Hunt Pratt, 34 Pine St.
257 R. E. Preusser, 78 Broadway.
356 N. D. Preston, Bradford, Pa.
198 W. A. Pullman, 18 Broadway, Seaboard Bank.

Q.

112 L. G. Quinlin, 21 New St., L. G. Quinlin & Co.

R.

101 E. Randebrock, 81 New St.
457 Robt. C. Rathbone, 205 Broadway, R. C. Rathbone & Co.
691 Seely, Raunheim, 121 Green St.
541 R. M. Raven, 15 Wall St.
414 Edwin C. Ray, 44 East Thirty-fifth St.
658 James W. Raynor, 4 Stone St.
146 F. W. Reimler, 44 Exchange Place.
581 Herm Reimers, 67 Pine St., Chas. Lowenthal & Co.
23 Gustavus Rice, 42 Walker St.
362 A. Richards, Forestville, N. Y.
181 Wm. N. Riddle, Pittsburg, Pa., Penn. Bank.
196 Henry R. Ritch, 18 Broadway.
37 Hiram Robbins, 18 Broadway.
653 E. T. Roberts, Titusville, Pa., W. B. Roberts & Son.
401 Henry J. Robinson, 60 W. Twenty-third St., Best & Co.
690 N. M. Robinson, 2 Stone St.
118 Wm. Rockefeller, 44 Broadway, Standard Oil Co.
48 Livingston Roe, 52 Broad St.

462 Robert L. Roe, 32 Broad St., Van Schaick & Co.
509 George W. Rogers, 115 Broadway, Room 119.
57 H. H. Rogers, 46 Broadway, Chas. Pratt & Co.
245 Abm. Rossman, foot of Forty-fourth St., East River.
582 A. H. Rondebush, 61 Temple.
27 Clint Rondebush, 18 Broadway.
142 F. L. Rondebush, 18 Broadway.
354 Chas. T. Russell, 721 Broadway, Russell Bros., London, England.

S.

56 Chas. H. Salisbury, 56 Broadway, Bunker, Allen & Co.
618 Ed. Sallinger, 51 Exchange Place.
577 Chas. Samuels, Bradford, Pa.
512 John Satterfield, Buffalo, N. Y., Union Oil Co.
590 John H. Scheel, 5 Front St., P. H. Van Riper & Co.
165 Edward G. Schill, 56 Broad St.
26 E. Schilling, 54 Broad St., Room 4.
393 Joseph Schlesinger, Bradford, Pa.
195 Chas. Schmitt, 18 Broadway.
501 Samuel Scholle, 48 Broad St.
592 John G. Schram, 127 Pearl St., J. G. Schram & Co.
530 G. B. Scranton, 72 Broadway.
529 E. S. Scranton, 72 Broadway.
413 W. L. Scrymser, 44 Broadway, Standard Oil Co.
598 John Sealy, 11 South St.
357 Chas. A. Seaman, 82 South Tenth St., Brooklyn, N. Y.
568 E. A. Seccomb, 68 Broad St., Brown & Seccomb.
44 Joseph Seep, Bradford, Pa.
316 Chas. E. Seitz, 90 Pine St., Seitz & Croold.
332 C. C. Selden, Oil City, Pa.
230 S. J. Seligman, 184 and 186 Church St.
221 Wash. Seligman, 51 New St.
528 A. N. Selter, 101 Pearl St., Chapman & Selter.
82 J. Sengstacke, 18 Broadway, Nic Mehlen .
634 W. G. Sewall, 1 So. William St., P. H. Williams & Co.
90 A. W. Shepard, 29 Broad St.
223 David A. Sherman, 72 Broadway.
610 Geo. V. Shiner, 74 Broadway, Room 38.
344 Ratje Steidenburg, 2 and 4 Stone St.
336 James D. Simons, 52 Broadway.
77 Thomas B. Simpson, Oil City, Pa.
238 G. S. Small, Jr., 55 Stone St.
154 F. H. Skelding, 81 New St., Skelding & Farley.
652 G. S. Smallwood, 18 Broadway.
532 A. H. Smith, 324 Wall St., Mills, Robeson & Smith.
645 C. D. Smith, 6 Stone St.
580 E. F. Smith, Mills Building, Room 19.
513 Joseph M. Smith, 47 Cliff St.
535 Henry T. Smith, Glen Cove, L. I.
29 L. H. Smith, 18 Broadway, Smith & Crosby.
310 W. B. Smith, 60 Broadway.
456 Geo. W. Snedeker, 52 Broad St., Livingston Roe.
151 L. V. Sone, 18 Broadway.
83 E. E. Sonneborn, 40 Broad St., Sonneborn & Lauterbach.
609 H. B. Sonneborn, 40 Broad St., Sonneborn & Lauterbach.
170 Jonas Sonneborn, 40 Broad St., Sonneborn & Lauterbach.
229 S. S. Sonneborn, 40 Broad St., Sonneborn & Lauterbach.
335 Isaac M. Sowers, Oil City, Pa., Vandergrift & Sowers.
331 Daniel Speyer, 52 Broadway, Bernheimer & Speyer.
471 Leo Speyer, 8 Wall St., Simon Borg & Co.
5 H. Sproul, Cor. Fouth Ave. and Wood St., Pittsburg, Pa.
289 A. M. Spurr, 18 Broadway.
302 Nich. S. Stabb, 39 Broadway, Bowring & Archbold.
545 H. Stademair, 150 Pearl St., G. Amsink & Co.
107 G. W. Stahl, 44 Broadway, United Pipe Lines.
629 N. P. Stanton, 70 Broadway.
126 Chas. M. Stead, 62 Broadway, Allen & Stead.
218 Francis D. Stead, 62 Broadway, Allen & Stead.
601 J. D. Steele, Bradford, Pa., Box 1820.
410 Julius Stein, 197 Pearl St.
594 Wm. C. Steinkampf, 75 Broad St.
489 D. A. Stephenson, 18 Broadway.
178 Chas. A. Sterling, 55 Broadway National Storage Co.
673 Jos. Stettheimer, Bradford, Pa.
631 N. W. Stevenson, 17 Broadway.
314 J. F. Stewart, 22 Beaver St., M. N. Day.
403 Chas. E. St. John, Norwalk, Conn.
317 J. M. Stockton, 57 Broadway, J. M. Stockton & Co.
490 Ed. S. Stokes, Hoffman House, C. M. Reed & Co.
397 C. W. Stone, Oil City, Pa.
355 S. H. Stonehill, 138 West Forty-eighth St.
313 Geo. H. Stover, 88 Liberty St., Stover & Dilks.
491 W. H. Strawn, 196 Broadway.
31 S. F. Strong, 52 Broad St., Livingston Roe.
454 A. D. Sturges, 192 West St., Sturges & Westcott.
190 C. Sullivan, 46 Broadway, Chas. Pratt & Co.
160 A. A. Summer, 115 Broadway, Tidewater Pipe Co., (Ltd).
71 F. F. Sweeter, Titusville, Pa.

T.

678 Theo. E. Tack, 18 Broadway, Tack Bros.
329 Frank Tack, 18 Broadway, Tack Bros.
207 Alex. Taylor, Jr., 56 Broadway, Alex. Taylor & Sons.
677 D. E. Taylor, 11 South St., P. I. Nevins & Son.
408 Edward G. Taylor, 62 Broadway, L. G. Duinlin & Son.
389 Theodore Taylor, 24 New St.
189 H. L. Taylor, Titusville, Pa., Union Oil Co.
45 C. B. Tedcastle, Oil City, Pa., Livingston Roe.
391 Arthur Terry, 18 Broadway.
80 D. J. Thayer, Bradford, Pa.
656 H. L. Thiessing, 180 Broadway, O. M. Bogert & Co.
98 T. P. Thompson, Bradford, Pa., Box 1651.

349 Carlos Tirado, 54 William St., D. De Castro & Co.
619 F. Tobin, Winnepeg, Canada.
205 James A. Townsend, 37 South St.
553 M. Traubmann, 1540 Madison Ave.
235 Geo. P. Trigg, 273 Hudson St.
517 R. Travers, 6 Wall St., White, Morris & Co.
117 Carl Trube, 68 Broad St., Goepel & Trube.
382 Chas. H. Tully, 72 Wall St.
546 Wm. Turnbridge, 81 New St.

V.

100 Chas. H. Van Buren, 22 Beaver St., M. M. Day.
188 B. W. Vandergrift, Pittsburg, Pa., Vandergrift & Sawyer.
93 J. J. Vandergrift, Oil City, Pa., United Pipe Lines.
167 J. J. Vandergrift, Jr., 83 Wood St., Pittsburg, Pa.
524 Geo. T. Van Doren, 15 Broadway, Bailey, Coleman & Co.
184 W. L. Van Kirk, Pittsburg, Pa.
511 J. M. Van Orden, 22 Clinton Place.
591 C. H. S. Van Riper, 5 Front St., P. H. Van Riper & Co.
612 P. E. Van Riper, 5 Front St., P. H. Van Riper & Co.
589 P. H. Van Riper, 5 Front St., P. H. Van Riper & Co.
453 E. J. Van Sickle, 573 Broadway.
96 Geo. H. Van Vleck, Cor. Pearl and Niagara Sts., Buffalo, N. Y.
680 M. A. Van Winkle, 50 New St.
565 G. Varrelmann, 23 William St., Hermann, Koch & Co.
622 Geo. H. Vilas, 44 Broadway, Standard Oil Co.
296 Royal C. Vilas, 21 Cortlandt St.
224 Arthur H. Vogt, 8 Pine St.

W.

92 Wm. Wafer, 32 Platt St.
261 Chas. T. Wagner, 20 Green St.
557 W. Wagner, 18 Broadway.
104 A. B. Walker, Bradford, Pa.
406 E. A. Wallace, Jr., 18 Broadway.
140 Tom. T. Waller, 3 Broad St.
191 Jacob H. Walter, 169 Wood St., Pittsburg, Pa.
411 Sam'l Wann, 34 Broad St.
171 Maurice T. Ward, 72 Beaver St.
208 Thos. F. Warner, 5 New St., T. F. Warner.
365 W. C. Warner, Warren, Pa.
522 E. S. Waterman, 14 Nassau St.
556 D. B. Waters, 2 Wall St., First National Bank.
241 T. L. Watson, 49 Broadway, Watson & Gibson.
537 T. J. Watson, Pittsburg, Pa., Watson & Hill.
106 James A. Waugh, 30 Broad St., Hilton & Waugh.
11 H. M. Weed, 18 Broadway.
599 Herbert A. Weeks, 81 New St.
337 Chas. R. Weeks, 74 Murray St.
153 John C. Welch, 72 Beaver St.
39 W. J. Welch, Oil City, Pa.
265 S. S. Wenzell, 226 Walnut St., Phila., Pa.
415 J. P. Wessels, 74 Broad St., Beling, Niemeyer & Co.
395 E. N. Wescott, Syracuse, N. Y., Wescott & Co.
587 A. B. Weston, 71 Broadway.
124 Albert G. Wheeler, 55 Broadway.
121 Fred. R. Wheeler, 1080 Delaware Ave., Buffalo, N. Y.
95 S. A. Wheeler, 1080 Delaware Ave., Buffalo, N. Y.
420 W. W. White, Bradford, Pa.
231 James Whiteside, 92 Grand St., Jas. Whiteside & Co.
400 C. S. Whitney, Bradford, Pa., Whitney & Wheeler.
28 H. P. Whitney, Bradford, Pa.
659 D. O. Wickham, Titusville, Pa.
193 Edw. K. Willard, 72 Broadway, E. K. Willard & Co.
375 J. S. Willard, 72 Broadway, E. K. Willard & Co.
434 J. D. Williams, 116 Washington St., Chicago.
242 J. O. R. Wilson, Oil City, Pa., Box 34.
127 S. C. Wilson, 18 Broadway, Wilson & Anderson.
366 N. Witherell, 42 East 25th St.
304 Jos. Wolcott, 110 Exchange Block, Oil City, Pa.
378 Abiel Wood, 130 Pearl St., Bush & Denslow Mfg. Co.
55 M. P. Woodruff, 18 Broadway.
110 T. Woodward, Jr., 43 Water St.
493 H. R. Wright, 52 Broadway.
438 Sydney B. Wright, 81 New St., S. B. Wright.

Y.

156 F. A. Yenn, 125 Maiden Lane.
398 D. G. Young, 30 Broad St., Hilton & Waugh.
204 Wm. G. Young, 18 Broadway, Wm. G. Young & Co.

RULES ADOPTED BY THE CONFERENCE OF OIL EXCHANGES FOR THE PURPOSE OF SECURING UNIFORMITY IN BUSINESS BETWEEN THE OIL EXCHANGES.

PIPE LINE ACCEPTANCES.

1. In the Oil Exchanges deliveries of the oil of a pipe line shall be made in the acceptance or certificates of that pipe line, unless otherwise stipulated at the time a transaction is made. Such acceptances or certificates shall be storage paid.

2. Acceptances or certificates are pipage unpaid, unless otherwise ageed upon.

REGULAR OIL.

3. Regular oil means oil that is to be delivered on the first business day after the transaction.

4. All transactions, if not otherwise specified, shall be considered regular oil.

SPOT OR CASH OIL.

5. Spot or cash oil means oil that is to be delivered on the day of the transaction.

SELLER'S OPTION.

6. A seller's option means a transaction wherein the seller has the privilege to deliver the oil at any time within the time specified by giving the customary notice.

BUYER'S OPTION.

7. A buyer's option means a transaction wherin the buyer has the privilege to demand the delivery of the oil at any time within the time specified by giving the customary notice.

NOTICE ON B. & O. AND S. O.

8. If the oil on a buyer's or seller's option is desired to be delivered on a certain day, notice must be given on the previous business day, before 2:30 P. M. If the contract is not thus terminated or otherwise cancelled, the oil must be delivered on the last day.

"PUT."

9. A "Put" entitles the buyer of the "Put" to the privilege of putting oil to the other party at any time within the time specified at the price named by giving the customary notice.

"CALL."

10. A "Call" entitles the buyer to the privilege of calling on the seller for the oil at any time within the time specified at the price named by giving the customary notice.

11. Notices on "Puts" and "Calls" must be given during business hours. The notice makes it an absolute transaction, and the oil is delivered at the delivery that comes next in regular order.

WRITTEN CONTRACTS.

12. Written contracts shall be governed by these rules in so far as they are not provided for by their own written terms.

DEPOSITS TO SECURE TRANSACTIONS.

13. Either party to a transaction may, at any time during business hours, require the other party to deposit sufficient money or oil, as the party called on may select, to secure the transaction to a point ten cents per barrel, distant from the then market price if the market is below one dollar per barrel; and if the market is above one dollar, then this distance to be ten per cent. of the market price when the call is made. The party in whose favor the market may fluctuate shall have the power to call in like manner for additional deposits of not less than five cents per barrel to maintain but not exceed the margin. The deposit shall be made within half an hour from call. A failure or refusal to make the deposit within the specified time shall be considered a failure to fulfill the contract.

TIME OF PUTTING UP SECURITY ON TIME CONTRACT.

14. Upon the consummation of a time contract on which security is to be put up, it shall be the duty of the seller and buyer to sign or accept a contract therefor, and put up the specified amount of security within twenty-four hours after confirmation until such time as the required security is placed. The contract shall be subject to the preceding rule on deposits of security. A failure of either party to a contract to conform to this rule shall be considered a breach of contract, and the party guilty may be so proceeded against.

WHERE COLLATERAL SHALL BE PUT UP.

15. Unless otherwise agreed upon, collateral security must be put up in some bank in good standing where the party putting up said security is not owner or part owner.

PUBLIC OFFERS.

16. A declaration to buy or sell in open 'change can be accepted by any member. In case of misunderstanding in accepting offers to buy or sell it must be decided immediately by a vote of the members present.

FICTITIOUS SALES.

17. Fictitious transactions are positively forbidden, and render the parties concerned liable to fine, suspension or expulsion from the exchange.

TELEGRAPH ORDERS BETWEEN CORRESPONDENTS.

18. If not otherwise arranged, telegraphic orders between members of the various exchanges shall be good for at least twenty minutes from the time the telegram arrives at its destination, unless in the meantime said order shall be witdrawn; and said order shall not be considered withdrawn by party giving said order until such time as the withdrawal telegram shall have arrived at its destination and shall have been delivered to party addressed; or when said party cannot be found immediately, a reasonable time (say three minutes) elapses to permit said withdrawal telegram to have been delivered.

19. When contracts mature on Sunday or any

legal holiday, delivery shall be made on the succeeding business day. But where two holidays occur on consecutive days—as where Sunday immediately precedes or follows a legal holiday—contracts falling due upon the first of such holidays shall be settled upon the business day immediately preceding, and those maturing on the second of such holidays shall be settled upon the business day following the same.

CLOSING OF CONTRACTS.

20. If any member fails or refuses to comply with the requirements of a transaction, the other party shall have the privilege to close the transaction and establish the difference in the following manner: He shall notify the delinquent personally, or in writing, of his intention to close the contract under this rule. He shall then give the presiding officer a written order to buy or sell, as the case may be, the kind of oil and delivery the transaction calls for, which order shall be executed free of charge publicly for account of delinquent, and the transactions shall be recorded in the Arbitration Committee's book of awards. The delinquent may then forthwith be dealt with for default of contract. A failure to close out a transaction under this rule shall not relieve either party from the responsibilities of the contract. The Presiding Officer shall also have power in the same manner to close out and convert collateral security put up by a delinquent. The provisions of this rule shall apply to transactions between members of different conference exchanges, subject to the following conditions:—

The party desiring to close a transaction under this rule shall present a written statement of the contract, together with specific instructions to the presiding officer of the exchange to which he belongs, and said officer, after satisfying himself of the justice of the claim, shall forward the instructions to the presiding officer of the exchange of which the delinquent is a member. It is understood that in this, and all similar cases, the presiding officer acts as the agent of the parties, and neither he nor the exchange be held responsible for acts performed in accordance with the rules.

PUBLIC NOTICE TO ABSENTEES.

21. If a party to a transaction, or his agent, cannot be found at the exchange or his office, it shall be considered a good notice tender or demand, if the presiding officer shall publicly announce the business that is desired to be transacted with the absent party, and the absent party shall be held liable thereby. If the secretary of the exchange has no record of the office of a member it shall be held that the exchange room is his office or place of doing business.

BROKERAGE.

22. If not otherwise arranged, the brokerage on either a sale or a purchase shall be $2.50 per thousand barrels.

FRACTIONAL PRICES.

23. The price on public offers to buy or sell shall not be divided into smaller fractions than one-eight of a cent per barrel.

BUSINESS HOURS.

24. (As amended). The exchanges shall be open for business from 10 o'clock A. M., 75th meridian time, to 3 o'clock P. M. On Sundays and legal holidays the exchanges shall be closed.

25. The exchange shall not allow its members to engage in trading outside of business hours, either in spot or regular oil. Buyers or sellers options, "permanent loans," puts or calls; and in case of violation of this rule, or any other misconduct, the offender shall be brought up by his own exchange, or its members, or by members of other exchanges, and shall be fined, suspended, or expelled. The arbitration of the offense shall be subject to the rules of the exchange to which the offender belongs.

26. Any member in good standing of any exchange in the conference shall have the privilege of joining any or all other exchanges in the conference under the rules of the exchange to which such application is made.

SUSPENDED OR EXPELLED MEMBERS.

27. Any member of the several exchanges who may be suspended or expelled from either of the exchanges to which he belongs, shall likewise stand expelled from all the exchanges to which he belongs. A suspended or expelled member shall be ineligible to membership in any of the exchanges until such time as said member shall be reinstated. Notice of such suspension, expulsion or reinstatement must be sent to the several exchanges, and be placed upon bulletin board or otherwise duly advertised by the secretary of the exchange receiving such notice. Any member of any of the exchanges who makes trades on the floor of the exchange with or for a member who stands suspended or expelled from any of the exchanges, shall be liable to fine, suspension or expulsion from the exchange to which he belongs.

REJECTED APPLICANTS.

28. If any of the oil exchanges, adopting the Conference Rules, reject or refuse membership to a person, the secretary of said exchange shall communicate to the secretaries of the several oil exchanges the fact of such rejection, giving the result of the ballot cast for said applicant.

WHEN CONFERENCE RULES GO INTO EFFECT.

29. Each exchange in the conference shall have the same number of votes in adopting a rule, as it has representatives in the Conference of Exchanges, and when three-fourths of the representative vote of the exchanges connected with the conference shall report to the president their approval of any rule or law recom-

mended by the conference the president shall declare the rule or law adopted, and name the day and hour that it shall go into effect, not later than the information of the fact can reach all the exchanges.

ARBITRATION BETWEEN MEMBERS OF THE SEVERAL EXCHANGES.

30. A member who shall be accused of a breach of contract, violation of the conference rules, or any other misconduct by any member of any of the exchanges in this conference, shall be summoned before the Arbitration Committee of the Exchange to which said accused member belongs, the application for such arbitration shall be subject to the rules of the exchange where complaint is entered, and the decision is rendered in accordance with these rules.

31. The carrying charges on oil shall be due and payable when the oil is returned, provided that if the oil is carried more than one week the accrued carrying shall be due and payable Monday of each week.

32. When the kind of oil is not stated, it shall mean "National Transit Company through its United Pipe Lines Division."

CLEARING HOUSE RULES.

1. The Seaboard National Bank shall be the Clearing House agent of the exchange, and the clearance manager and assistant shall be sworn to secrecy in accordance with the agreement with said bank.

2. Each member or firm having transactions shall make a statement in ink, or blanks adopted by the exchange, of all such transactions, accompanied by a certified check, if there is a cash difference against him, or by National Transit Company certificates, or an accepted order therefor, if there is a difference against him in oil.

3. A failure to hand into the Clearing House a statement by 11:30 A. M. will subject the delinquents to a fine of $10 for the first offense, $20 for the second offense, and the third offense shall be reported to the Clearing House Committee, who shall report to the board of directors, recommending such penalty as they deem proper.

4. Any member handing a statement to the Clearing House containing an error, resulting from non-comparison, or any clerical error, shall pay a fine of $2.50.

5. No member may make or accept a public offer to buy or sell on the floor of the exchange, unless he participates in the Clearing House.

6. All transactions not otherwise specified shall be in "Regular Oil."

6. All transactions in "Regular Oil" of one day shall be cleared on the following business day.

8. Transactions in "Cash Oil" may be made before 11 A. M., and such transactions shall be cleared on the same day. Transactions in "Cash Oil" made after 11 A. M. shall be made Ex-Clearing House, and shall be so declared at the time of the transaction, and delivery shall be made before 2:15 P. M. and paid for by certified checks, whenever so demanded.

9. On all time contracts, where notice is given, such notice shall be given one hour before the closing of the Exchange, and the oil shall be cleared on the following business day. On all time contracts running to maturity the oil shall be cleared on the day when such contracts expire.

10. Notices on loaned or borrowed oil shall be given not later than 2:30 o'clock P. M.

When a member or firm fails to place his or their sheet in the Clearing House before 11:45 A. M. it shall be considered a default of contract, and the manager shall make up his or their sheet and present it to the presiding officer of the exchange, who shall notify each member or firm on the floor having such delinquent, and shall then buy or sell cash oil for account of such delinquent.

9. Supplementary sheet shall be placed with the Clearing House immediately by the buyers or sellers of such oil. The oil covered by such transactions must be placed in the Clearing House by 1:30 P. M., and the loss shall be borne *pro rata* by each interested party as the loss which he or they sustain bears to the gross amount of the failure. Checks for such loss shall be placed in the Clearing House as soon as the manager makes the amounts known.

12. All accrued charges on loaned oil shall be added to the amount due for the oil on the Clearing House sheet at the time of the return of the oil.

AGREEMENT WITH THE SEABOARD NATIONAL BANK.

The Seaboard National Bank agrees with the New York Petroleum Exchange that it will act as a Clearing House for the members of said exchange under its rules and regulations. The bank agrees to become responsible to the exchange for all oil or moneys entrusted to the Clearing House Department. The bank agrees that the managers of the Clearing House and his assistants shall be sworn to the strictest secrecy in every department, and to a faithful performance of their duties, and that they shall be *positively* prohibited from speculating, directly or indirectly, in oil. The Clearing House manager shall keep an account with each person or firm, charging the account with the total daily clearance as shown by his or their sheets, also charging such accounts with all fines which may be incurred by such members or firms under the rules of the Clearing House. The amounts collected for such fines shall be turned over to the treasurer of the exchange. The bank shall charge one cent for each thousand barrels cleared; one-half cent for each thousand barrels received, and one-half cent for each thousand barrels delivered, whenever the average clearances for any one month shall be 70,000,000 barrels, or more, as shown by the delivery sheet. Charges for clearing and fines shall be payable to the managers on demand. Each member having transactions shall make out a statement on blanks adopted by the exchange, of all oil coming in and going out, accompanied by a certified check if the difference is against the sheet, or with the oil if the sheet shows more going out than coming in.

All statements must be placed in the Clearing House by 11:30 A. M., and the Clearing House shall settle all accounts by 2 P. M. on the same day by giving checks and delivering the oil. The managers shall give

each day to the superintendent of the exchange a statement showing the total of the clearances of that day. This agreement may be terminated or any of its terms altered by either party on giving thirty days' notice.

In witness whereof, the president and cashier of the Seaboard National Bank have hereunto affixed their signatures for the bank, this 1st day of May, A. D., 1883, under the seal of said bank.

(Signed) W. A. PULLMAN, President.
S. G. NELSON, Cashier.

In witness whereof, The New York Petroleum Exchange have caused their president, secretary and treasurer to sign this agreement with their respective hands, and seal with the official seal of said exchange, this 1st day of February, A. D. 1883.

(Signed) L. H. SMITH, President.
W. FISHER, Secretary.
H. M. CURTIS, Treasurer.

SUPERINTENDENT'S REPORT, MAY 1, 1887.

Cash on hand May 1, 1883.....$		361.10
Received from treasurer during year		3,600.00
		$3,636.10
Operator Oil City Blackboard.....	940.25	
Operator drum indicator.....	465.50	
Clerk collecting transactions.....	323.00	
Man in charge of cloak room.....	81.50	
Assistant doorkeeper.....	270.00	
Telephone boy.....	234.00	
Messenger	208.00	
Election inspectors.....	30.00	
Postage and messengers.....	154.80	
Matches	17.60	
Washing towels.....	40.00	
Expenses board of directors and committee meetings	716.05	
Various items.....	66.35	
Balance	89.05	$3,636.10

Two thousand three hundred and seventy-two gentlemen were visitors on the floor of our exchange for the fiscal year. The highest number (261) were registered during August, 1883, and the lowest (146) during January, 1884.

The official Weekly Circular has been published regularly. The subscriptions have paid the expenses of printing, and for the year October 1st, 1882, to October 1st, 1883, a balance of $9.61 was deliverd into the treasury of the exchange.

All members are respectfully requested to notify the superintendent of any change of their office addresses.

RUD. HUBEN, Superintendent.

Any members of oil exchanges entitled to the reduction of commissions as here authorized shall be held to maintain the full rates specified for the public in all business in petroleum done through them, and any such members of said oil exchanges who shall be proved as dealing for others for less rates than established by this board for the public, or who shall fail to answer charges of so doing before the tribunals of the oil exchange, shall be thereafter debarred from any reduction of commissions from the full rates.

HENRY B. GOMBERS.
60 Broadway.
N .Y. MINING STOCK AND NATIONAL PETROLEUM EXCHANGE.

Rates of commission on pipe lines certificates of petroleum:—

50c. per 100 barrels between members when principal is given up at the time.

75c. per 100 barrels between members when principal is not given up.

$1.00 per 1,000 barrels to members of the New York Stock Exchange.

$1.25 per 1,000 barrels to members of the New York Produce, Petroleum & Cotton Exchanges, and of all recognized Stock and Petroleum Exchanges in other cities, including the Chicago Board of Trade.

$2.50 per 1,000 barrels to all others.

Copy of circular sent out by oil brokers to catch the little "lambs":—

F. B. WARNER, JR. H. N. UHLER, JR. J. K. CALDWELL

F. B. WARNER, JR., & CO.
140 South Third Street.

STOCKS BONDS, AND PETROLEUM CERTIFICATES BOUGHT AND SOLD FOR CASH, OR CARRIED ON FAVORABLE TERMS.

Private Wire to E. V. Selden, Oil City, Pa.

SHIPPERS OF CRUDE PETROLEUM.

PHILADELFHIA, April 9th, 1885.

The Petroleum market opened strong this morning on the Anglo-Russian war news, and advanced in sympathy with a general rise in the stock, grain, and provision markets. After touching 79, some realizing sales broke the price of ½ ct., but orders from New York parties, who were buying at the opening, advanced the price to the highest point of the day, when the market became dull. The decline in the last hour to 78¼ was on light transactions and due to the anxiety felt concerning Ackerly No. 2, which, as well as Producers' No. 13, will be shot this afternoon.

Producers' No. 15 continues to make a good showing, the latest gauge being 71 bbls, per hour. The next wells to be brought in, are Murphy No. 3, which is 50 feet in the sand, No. 5, 30 feet in the sand, and Producers' No. 19, 20 feet in the sand. Murphy No. 5

is east of Producers' No. 15 and should make a good well, while the productiveness of No. 3 is doubtful. Ackerly No. 1 is flowing 47 bbls. per hour; Philips, 19 bbls; Producers' No. 18, 20 bbls. and Fisher No. 14, 40 bbls. This morning's gauge of Thorn Creek shows a decline of 1,038 bbls., being 9,578 bbls.

Carrying rates, Philadelphia, 25 cents; Oil City, 30 cents.

Opened, 77⅝. Highest, 79⅜. Lowest, 77⅞. Closed, 78¼.

CHARTERS.

	Barrels.
April 7	77,182
Previously reported	233,016
Total	310,198

SHIPMENTS.

April 7	79,136
Previously reported	302,153
Total	381,289

RUNS.

April 7	57,966
Previously reported	317,145
Total	375,111

Excess of shipments over runs, April 1st to 7th, inclusive, 6,178 bbls.

REFINED.

New York	7⅞ cts.
London	6¾d.@7d.
Liverpool	6¾d.
Antwerp	17¾ fr.
Crude sales	672,000 bbls.
Clearances	1,250,000 bbls.

STOCK QUOTATIONS.

	Op'g.	Hght.	Lwst.	Clsg.
Nor. Pac. Pref.	39¾	40⅛	39⅜	40⅛
Chic. M. & St. P.	69¾	71½	69¾	71½
N. J. Central	34½	35⅜	33⅞	35⅜
Pennsylvania	54¼	54⅜	54⅛	54¼
Oregon & Trans.	11½	11⅝	11½	11¾

Total sales 32,220 shares.

RANGE OF PRICES BY TELEGRAPH FROM OIL CITY.

Opened: 77½, 78⅜, 78, 78¼, 78⅛, 78⅝, 78½, 78⅞, 78¾, 79, 78⅜, 78⅞, 78⅝, 79⅛, 78¾, 79, 78⅝, 78¾, 78½, 78⅞, 78⅝, 79, 78⅞, 79¼, 79, 79⅜, 79⅛, 79¼, 79, 79⅛, 78⅞, 79⅛, 78⅝, 78⅞, 78¼, 78⅜, 78⅛.

Highest, 79⅜. Lowest, 77½.

WILDCAT MYSTERY WELLS WATCHED AND REPORTED BY SCOUTS.

A report was spread in the oil exchanges one day in the fall of 1882 that a wildcat well in Forest county, Pa., had been drilled in the sand and was making a good showing.

At that time nearly all the scouts in the field were scattered around in the oil villages not far from the Cooper tract, in Forest county, Pa., where they had been giving their attention to a new well which had just been drilled by the Anchor Oil Company. The wildcat was some fifty miles or more away. "The operators will know all about the wildcat before the exchanges open tomorrow morning," said an old scout who sat by the fire that evening in the Jamestown House at Garfield, Pa. "Twenty-five or thirty scouts started for the well this afternoon."

The life of a scout is different from that of any other man in the oil region. Much of his work must be done in the night. He is compelled to make long journeys on foot and to sleep many nights on the ground. He must know all there is to be known about an oil well, and, above all, thoroughly trustworthy. His pay is about $150 a month, and he usually gets a percentage of all profits resulting from transactions made on information furnished by him. His expenses are paid by the operator in whose interest he is working, and he may use his discretion as to how large a bribe it is necessary to offer a guard at a well for a sample of the sand or an opportunity to pass the lines and gauge the flow. Many of the scouts have had experience in drilling wells and guarding them, and all are men who have an intimate knowledge of the oil fields, above and below ground.

STRATEGY OF THE OIL FIELDS.

When a producer sets out to make a well a mystery he knows that he has a task before him. The high board fence which he puts around his well, a hundred feet or more from the derrick, prevents the scouts from getting samples of the sand unless they do so by arrangement with a guard. If the scouts succeed in obtaining a thimbleful of sand they can make a good guess as to what the well will amount to. Some of the scouts have as many as four or five hundred phials of sand, each of which is labelled with the name or number of the well from which it was taken. In some tracts the sand is of the color of pulverized fire-brick, in others it is chocolate-colored, and in others it is white, gray and variegated. The experienced scout can see something significant either in the composition or color of every sample of sand that he examines.

"This," said a scout, holding up a phial in which was as much gray sand as could be taken upon the blade of a penknife, "was very precious at the time it was obtained. It came from the great mystery of 646 in Cherry Grove, Warren county, Pa."

After an owner of a mystery has made provision for preventing the scouts from getting any of the

sand, he must make arrangements for keeping them so far from the well that they cannot hear the flow of oil into the receiving tank. So he cuts underbrush and surrounds his well with an almost impenetrable brush fence, on the outside of which he stations guards with rifles or pole axes as weapons. As many as a hundred guards are sometimes employed at a single well. If the scouts are unable to make their way through this line and get within hearing distance of the tank, they must trust to sight for indications as to what is doing at the well. The wag of the walking beam will tell them within fifty feet how deep the well is, though a stranger can only see that the beam oscillates with a slower motion as the well grows deeper. If drilling has ceased the scouts watch the ventilator of the receiving tank with the aid of a field glass, noting the number of hours out of twenty-four that the inflow of oil causes gas to escape from the ventilator in a thin cloud. Knowing the number of gallons that will flow through the pipe in an hour, they can compute the result of the flows that have taken place in the twenty-four hours. Another way of telling how deep a well has been drilled is by watching the cable through a field glass when the tools are pulled up. As the rope is wound upon the bull wheel the coil runs to one end of the axle and back again, and so on, like thread wound evenly on a spool; and, by watching the weaving of the rope back and forth where it comes in sight above the roof of the derrick, the scouts can tell how many layers there are of the rope that is wound up, and can make a close guess as to the number of feet of rope drawn from the well.

SI HUGHES'S EXPLOIT.

An old scout told the following story of an exploit which made Scout Si Hughes famous throughout the oil region:

"Ten days before the Cherry Grove wildcat 646 was opened excitement as to what the well was doing was at fever heat. It was believed that she was flowing strongly, but nothing was known for certain. No scout had succeeded in getting past the guards, and no sand had been secured. Si Hughes was then working for J. A. Cadwallader. Cadwallader offered him a tenth interest in all the land secured on any information which he would bring from the well. Hughes suddenly disappeared. None of the men in the field knew what had become of him. Three days later he suddenly reappeared, looking as though he had been drawn through a knot-hole. Cadwallader began buying land near 646. He took in partners, a stock company was formed, more land was bought, and wells were drilled. Hughes had been lying for forty-eight hours under the derrick floor of 646—lying there in the cold mud with nothing to eat, and he had piped off the mystery so that he knew exactly what she was doing. How he got in there nobody but himself knows. The stockholders in the company that began operations on his information kicked about keeping the bargain to give him a tenth interest, and offered him $4,500 for his work. Hughes refused it. He said he would have what he bargained for or nothing.

Another scout, speaking of Hughes' exploit, said that, although the matter was unsettled, Hughes was sure of at least $50,000 for his two days' and two nights' work under the derrick floor of 646.

By such expedients as have been described, and by many others, the scouts obtain information as to the closely-guarded mysteries. Then they hasten to the nearest telegraph station and send cipher dispatches to the operators for whom they are scouting, telling the results of their work. The codes used for this purpose are extensive enough to convey any necessary information concerning doings in the oil field. Going into the exchange with this knowledge as to the well that is attracting the greatest attention as being the most likely to have an effect on the market, the operator possesses a great advantage over all who do not have as trustworthy information. In spite of the strife between them, some of the scouts are on the best of terms with the producers to whose wells they have given the closest and most unwelcome attention. When the mystery is opened the game is ended, and scouts and producers laugh over the strategy with which it was played.

A CAPTIVE SCOUT.

Now and then the men guarding a well capture a scout in the act of attempting to get through the lines to a place where he can hear the flow of the oil into the tank. Late in November the mystery that was attracting the most attention was the new Anchor well in the Cooper tract. The derrick stands on the side of a wooded hill. It was guarded by a large force of Swedes armed with pole-axes. The woods fairly swarmed with scouts. The campfires of the Swedes and of the scouts across the ravine suggested, after nightfall, the encampment of opposing armies. One night the guards heard a rustle of leaves and crackling of dry twigs close to the lines. A posse of them made a rush toward the spot whence the noise came. Two scouts were found stealthily making their way toward the well, crawling on all fours through the thicket and along the trunks of fallen trees. At the approach of the guards the scouts sprang to their feet and made off into the woods, closely followed by a dozen Swedes. One of the loghuggers was captured. There was no need of asking questions; captors and captives understood each other perfectly. The scout was securely bound with ropes. Then the guards offered to take him to a shanty where he would have protection from the chilling night wind; but he declined to accept any favor from them, and two men were detailed to stand guard over him till morning. There was not much about him except his plight to suggest the captive who stood "chained in the market-place," but he was as stolid as any captive could be. The next morning he was released with the assurance that he would not escape rough usage if caught again. A scout said afterward that the man

who was captured had caused the arrest of the guards who detained him, and that a test case was to be made of it.

"The scout was guilty of nothing but trespass," said he, "the penalty of which is only a few cents. Operators can well afford to have their scouts plead guilty of this offense as often as they are caught, in view of the value of the information they obtain for them."

MAKING IT A MYSTERY.

One of the most noteworthy mysteries of the oil region was the Shannon well, the wildcat venture of the Cooper tract in Forest county, Pa. Some time in June, 1883, Mr. P. M. Shannon, a producer of long experience, followed the 45-degree line from Sheffield nine miles into the wilderness. There, at a point six miles southeast of the famous Cherry Grove field, and nearly five miles from the nearest cabin, he put up a rig and began drilling. Before the tools reached the sand he took two partners into the venture, Mr. T. F. Melvin and Mr. A. B. Walker. On July 26 the three partners stopped at the well on their way back from a fishing excursion. They learned from the drillers that, according to their reckoning of the altitude at which drilling was begun, sand should already have been struck if there was any there. The partners were not very hopeful as to their venture, and Messrs. Melvin and Walker decided that they had seen enough of the wildcat for the present, and went on up to Cherry Grove, leaving Mr. Shannon behind. He remembered that a spring barometer had been used for determining the altitude of the locality, and that the measurement might have been so far out of the way that there was still hope of striking oil sand. Just before noon on that day the driller said to Mr. Shannon:

"I guess we've struck something."

"The tools were pulled out," said Mr. Shannon, telling the story of his venture, "and a fresh bit was put on. Drilling was resumed, and within ten minutes an odor of gas came from the well. Our fuel had given out and we were burning hemlock bark.

" 'Getting a little gas,' said the driller; 'better look out for the fire.'

"I put my head down to the hole and heard a rushing sound far down in the well. The tools were pulled out as quickly as possible, and the bailer was run down. The oil had risen five hundred feet in the well, though the bit had gone only about ten inches into the sand. The rushing sound continued, and it was plain that there was going to be a strong flow unless the well was plugged. We had a few plugs on hand. Two or three of these were put in and driven down. I would rather have given five thousand dollars than have her flow; but in about an hour and a half she began to spout. The oil saturated the ground and ran down the hillside into the brook. I am not accustomed to manual labor, but I pulled off my coat and went to work damming the brook, so that the oil would not float down on the water and tell the story.

AN UNEXPECTED DANGER.

"I sent a note to my partners, which I believe one of them has had framed. I don't remember just what it was, but it was something about her being 'a teaser.' Another messenger was sent to Sheffield for more plugs. While he was away the well flowed again, and we put down the last plugs we had on hand and then shoveled sand into the hole and drove it down, but still she flowed. The messenger got back from Sheffield the next morning, bringing plugs in a bundle of hay across the saddle. This precaution was necessary, for news concerning a new well spreads like wildfire, and it takes only a little while for the scouts to be on hand. My partners arrived at the well at about 10 o'clock that morning. They thought my message was a joke, but had procured some plugs and come on. More plugs were then driven down, and the flow was stopped. The last plug, however, had stopped about 500 feet from the bottom, and could not be driven further. The tools rested on it.

" 'You had better pull out the tools,' said I to the driller; 'I guess she will stay plugged now.'

"The driller started to haul up the tools, but I noticed that the rope was coming out of the well slack, and called the driller's attention.

" 'She's flowing the tools out of the well.'

"I began to say something about that being too old a gag, when he yelled:

" 'They're coming—run, for God's sake!'

"Before the words were out of his mouth there was a noise as of a tremendous explosion, and the tools, weighing about three or four thousand pounds, were shot up through the top of the derrick at least sixty feet and came crashing down through the roof, splintering the floor and sticking into the ground some eight or ten feet. That's the first and last time I ever saw a set of drilling tools thrown out of the well by the flow. We put down eight more plugs, but she continued to leak at the rate of at least fifty barrels a day.

GUARDED BY RIFLEMEN.

"The question then was how to keep the well a mystery. The two drillers, two tool-dressers and seven hunters were armed with Springfield rifles. A path marking a hexagon around the well was cleared in the underbrush, and a man was stationed at each of the six corners with orders to let no one cross the path. The path was lighted up with lanterns at night, so that no scout could creep across in the darkness. Provisions were sent to the men, who had their regular hours on guard, under command of Captain Haight—as the men called him—who was the contractor for drilling the well. The well was thus kept under guard till September 15, when she was opened to anybody who wanted to see it. The well prdouced 600 barrels of oil a day when first drilled in."

The oil scouts at the Great Mystery of 646, Cherry Grove, Warren county, Pa., and the Shannon Mystery, of Forest county, Pa., were: S. B. Hughes,

J. C. Tennent, P. C. Boyle, W. C. Edwards, J. C. McMullen, Frank H. Taylor, Joseph Craig, Joseph Cappeau, James Emery and J. H. Rathburn.

The oil scouts at the Phillips School-house well, Thorn Creek, Butler county, Pa., in 1884, were: Mike Murphy, William Barnsdall, Charles Goodwin and Hon. M. N. Lockwood.

In the days of the oil exchange the market was governd by the "wildcat wells" or new production. When a wildcat well was due to strike the sand the scouts would watch the well come in. If it was a large well the market would drop and the producers would lose money, but if it was a dry hole the market would remain steady or go up. This taught the oil operators to employ scouts to report the wildcat wells to them. If the wells were large the operator would sell all of his oil before the market would drop, and if it was a dry hole they would hold their oil for a higher market.

The oil scouts had a great number of hardships. Their work was mostly done at night and through the day they would sleep under the derrick or brush pile. When the oil exchanges closed the oil scouts' work was done.

The oil exchanges closed in 1896-1897, after many fortunes had been gained, and many a "lamb" was shorn and many a "duck" lamed. It was a raging fever, a delirium of excitement, compressing many years of ordinary anxiety and haste into one week, and one disastrous break in the market after another began to allay the fever for speculating on the oil exchanges. As the years passed there was less demand for opportunities to gamble by putting up margins.

One of the worst features was the manipulation of the oil market in the oil exchanges by the large oil producers or by the brokers holding large amounts of oil under orders "to sell when it raises or falls to a certain figure," and whenever the market reached one of the two points the large producers and brokers unloaded their oil on the market in the oil exchanges and up or down would go the market with a crash, and then a panic would ensue among the smaller holders of oil, as they were termed the "lambs," and again they were shorn of their fleece and called on by their brokers to make good by putting up more margins. After the public and people in general became more acquainted with the oil exchange and brokers' methods the exchanges and brokers began to lose their business, and on January 23, 1895, when the Seep Purchasing Agency, a branch of the Standard Oil Company, announced that they would quote their own prices for crude oil and not be influenced any longer by the oil exchange market quotations, came the death knell to the oil exchanges. But little is said in the oil country at the present day of the oil exchange. Day after day passes without a single sale having been made, and frequently the clearances for the entire month do not amount to 8,000 barrels. Several years ago, after the oil excitement subsided, for the purpose of keeping the exchange in existence, the brokers satisfied their speculators' thirst by trading in grain on quotations obtained from the Chicago Board of Trade. This was continued for a number of years and up until the Board of Trade shut off furnishing outsiders with the quotations. The transactions in grain were large, and at the present time a small amount of business is done on the New York grain quotations. Parker had a lively exchange during the early oil excitement, and the greatest bull movement in the history of oil originated at that place. But as the time wore on trade slacked, the exchange was closed, and the "boys" shifted to Bradford, Oil City, Titusville, Warren, Pittsburg and New York.

The Bradford exchange was started on January 1, 1881, with fifty members and a $40,000 building. Five hundred others organized the Producers' Petroleum Exchange and erected a handsome brick block, occupying it on January 2, 1882. Both exchanges did an immense business for years, but now both have subsided and the buildings are stores and offices. The Titusville exchange, which was constructed during the early oil days, has gone the same road. Captain Vandergrift built the old Pittsburg Oil Exchange, which was the finest one of them all, and the exchanges in New York and Oil City are the only ones now doing business. The exchange at Oil City, Pa., is known as the Oil City Oil, Grain and Stock Exchange. The officers are: E. V. D. Selden, President; John M. Reed, Vice President; G. W. McClintock, Secretary, Treasurer and Clearance-House Manager. Directors: N. F. Hilton, O. H. Strong, J. M. McCarty, Leo Milton, J. Goettel, S. H. Simpson, William Perry, E. McCracken, S. Y. Ramage, George H. Torrey and F. N. Chambers.

The New York Oil Exchange is known as the Consolidated Stock and Petroleum Exchange, Broadway and Exchange Place, New York.

The oil exchange in New York was erected in 1887, on Broadway and Exchange Place. At one time it had 2,400 members ,and its membership was the largest in the country save the Produce Exchange. Its seats sold as high as $3,000, and its business at times exceeded the transactions of the Stock Exchange. Now oil is hardly mentioned once a week. The exchange at Philadelphia was of a lesser degree, and a score of oil towns sharpened their appetite for speculation by establishing branch concerns and bucket shops. The latter now flourish in the oil country, and the almost entire disappearance of the speculative oil trade is not the least remarkable, as the producers generally sell their oil in the shape of credit balances. Credit balances is the number of barrels of oil in the pipe line credited to the owner, for which a receipt in the shape of a negotiable oil certificate is given. The oil is stored in the pipe line company's large iron tanks, free of storage for the first fifteen days; after that a small storage is charged. In case of fire or loss of the oil by accident, the owners lose a percentage of their oil, the pipe line company runs no risk, as they act as the owner's agent, in case of accident. This is called "general average." Ninety per cent. of the oil is bought by the Standard Oil Company, through checks issued on the Seaboard National Bank of

New York, indorsed by Joseph Seep, the purchasing agent.

THE BEGINNING OF OIL PIPE LINES—THE EARLY AND LATER MODES OF OIL TRANSPORTATION.

The early oil operator had many difficulties to contend with in the transportation of his oil to market, as the only mode of land-carriage consisted in hauling the oil from the wells to Titusville and Oil City, Pa., or other shipping points. The roads were bad, and when much used and in wet weather, they then became almost impassable. The author of "Petrolia," writing on this subject, says:

"Oil Creek mud attained a fame in the earlier and subsequent years that will be fresh in the memory of those who saw and were compelled to wade through it. Teamsters and horsemen swore both loud and deep at it. Newspaper correspondents exhausted all their adjectives, epithets and expletives in essaying to give a faint description of its demerits. Weary pedestrian pilgrims, like Bunyan's Christian, were inclined to part with their knapsacks after a brief experience; ministers of the Gospel and devoted laymen earnestly desired sustaining grace while urging their weary beasts over and through it. Mud, deep, and indescribably disgusting, covered all the main and by-roads in wet weather, while the streets of the towns composing the chief shipping points had the appearance of liquid lakes or lanes of mud."

The difficulties of moving the thousands of barrels of oil which it was necessary to transport can be better imagined than described. It was indeed a huge task, and many were the mishaps attendant upon the rough and swearing teamsters, as was evidenced to anyone passing along the line of roads leading to a large shipping point, as the way was literally strewn with broken wagons, dead horses, oil barrels, filled and empty. Some one conceived the idea of conveying the oil down Oil Creek to the Allegheny in flat boats, to hold the oil in barrels or bulk, and the employment of pond-freshets to float the boats, when laden with oil. Flat-bottom boats were procured from the upper Allegheny, and from all opints where they were built. Arrangements were made with the mill owners at the headwaters of Oil Creek for the use of their surplus water at stated intervals. The boats were towed up the creek by horses—not by a tow-path, but through the stream—to the various points of loading, and when laden they were floated off upon a pond-freshet. The amount of oil brought down upon one of these pond-freshets averaged from 15,000 to 20,000 barrels—the largest quantity ever brought out of "the creek" upon a single freshet would not exceed 40,000 barrels. The oil was transferred at the oil wharves at Oil City to a larger and better class of boats, and floated down the Allegheny to Pittsburg.

At one time over 1,000 boats were employed on the creek and river, and in addition to these there were some thirty steamers, passenger and towboats engaged in the same traffic. This oil float furnished employment to about 4,000 men.

Collisions and "jams" were of common occurrence; a boat would by some mismanagement get aground, and thus swing round, by the force of the stream, when it filled with water and sunk. Against this obstacle the advancing boats dashed with great force, the weaker ones becoming splintered from the concussion, the stronger ones being wedged fast, in the order in which they came, and thus formed what is familiarly known on Oil Creek as "a jam." During the freshet of May, 1864, a "jam" occurred at Oil City, which resulted in the loss of from 20,000 to 30,000 barrels of oil.

The magnitude of the oil business soon attracted the attention of railroads running near the oil region. The Atlantic & Great Western Railway first built a branch road from their main line at Meadville to Franklin, thus opening an avenue of traffic to New York, Philadelphia and Cleveland. About this time, 1861-2, the Oil Creek road was projected and built from Corry to Titusville, thus connecting with the Philadelphia & Erie Railroad. The Oil Creek road was gradually extended down the valley of Oil Creek to Shaffer farm. In the winter of 1865 and 1866 the Atlantic & Great Western extended their branch road from Franklin to Oil City. I need not here occupy the reader's attention with a particular account of railroad developments in the oil region. It is sufficient to say that the country has ample accommodations in this respect at the present moment.

With the advent of railroads the mode of doing business was revolutionized. Car tanks were brought into use, each car being mounted with two wooden tanks, having a capacity of about forty barrels each, and by the aid of pipe lines were filled upon the railroad track with great ease, and at much less expense, compared with the old system. The wooden car tanks later gave way to the iron cylinder-shaped single tank, which held about the same amount of oil as the two wooden tanks. These were used for transporting both crude and refined oils. A great many railroad companies owned iron car tanks for the transit of oil. There were, on all the railroads that handled petroleum, about 2,500 iron bulk cars, of an average capacity of eighty-five barrels to a car, giving a tankage capacity on wheels of 212,500 barrels. Cars that carried oil in barrels were not included in this aggregate.

The expense of hauling by team was an important and expensive item, and helped to reduce the gross price of oil. During the spring and summer of 1862 the price paid for hauling or teaming oil from the flowing wells on the lower McElhenny farm to Oil City and Titusville was from half a dollar to a dollar and a half per barrel. Later in the fall of that year three dollars to three dollars and fifty, and even four dollars per barrel was paid.

The magnitude of the petroleum industry made it necessary to find some mode of transportation even cheaper than a railroad. By force of circumstances

barges and tank cars for oil in bulk displaced the truck carrying oil in barrels. The pipe line, in turn, displaced the car and boat. The introduction of this mode of transporting oil marks an era in the petroleum industry. The freight by rail amounted to five or six dollars per car from the oil region to New York. It was most economical, therefore, to refine the crude near the wells; so that freight need be paid only on the products desired, and the quantity to be moved reduced to a minimum. The country around Pittsburg and Oil City was filled with little works taking out of the crude the refined oil needed for export. When the idea of allowing the oil to flow from place to place through iron pipes was put into practical form the cost of transportation was so much reduced that a few enormous refineries were built at the seaboard near New York, Philadelphia and Baltimore; and on the shores of Lake Erie, near Buffalo and Cleveland, to do the work which the almost countless small refineries in the oil region had heretofore done. This meant a revolution in methods of manufacture and in costs. Careful search has been made in the existing literature on petroleum to find the first reference to the use of a pipe line for the transportation of oil. The account given by C. L. Wheeler, quoted by Peckham from the Bradford Era, probably deserves this distinction:

"He said, in substance, that the first suggestion of a pipe line for transporting oil, so far as he knew, was made to him by General S. D. Karns, at Parkersburg, W. Va., in November, 1860. Mr. Karns said that as soon as he could raise the money he would lay a six-inch gas pipe from Burning Springs to Parkersburg and let the oil gravitate to the Ohio River, a distance of thirty-six miles. For some reason, this line was never laid. Some years after—Mr. Wheeler was unable to recall the exact date—a Mr. J. L. Hutchinson, inventor of the rotary pump which bears his name, conceived the idea of forcing oil through pipes, and explained his plan to John Dalzell and the narrator in the latter's office in Titusville. Subsequently Hutchinson's plans became a reality, the first pipe line being laid from the Sherman well to the terminus of the railroad at Miller farm, a distance of about three miles. The inventor's idea of the hydraulic pressure of a column of that length was certainly very exalted, and he took elaborate pains to prevent the breaking of pipes. At intervals of fifty or one hundred feet were air chambers like those on the old-style field pumps, ten inches in diameter, for the purpose of equalizing the pressure. These queer protuberances gave the line the appearance of a fence with ornamental posts, and excited great curiosity. The weak point, however, was the jointing, which, as the pipes were made of cast-iron and imperfectly finished at their ends, was very defective, and the leakage from this cause was so great that little, if any, oil ever reached the end of the line. It was a success theoretically, but a mechanical failure. Thus the expectations for easy and cheap transportation for crude oil raised by the building of the first pipe line were ruthlessly dashed to the ground and the inventor discontinued his experiments in despair."

In 1862 a bill was introduced in the Pennsylvania Legislature to authorize the construction of a pipe line from Oil Creek to Kittanning; but, owing to the vigorous opposition of those interested in teaming oil, it was not passed. Later a plan to lay a line down the Allegheny River to Pittsburg for the same reason came to nothing.

Samuel Van Syckle, of Titusville, Pa., was the first to put down a working line. It was only four miles long, extending from Pithole to Miller's farm, and carried but eight barrels per day. It demonstrated, however, the thorough practicability of moving oil in this way. The difficulty up to this time had been in making the joints of the pipe tight. Van Syckle overcame this; and, although his line faced an ascent of nearly five hundred feet, the oil was delivered at the further end practically without loss. Its construction required a large amount of money, involving Mr. Van Syckle in debt and embarrassments. The First National Bank of Titusville, then in the height of its power and prosperity, came to the relief of the enterprising gentleman identified with the construction of this new mode of transporting oil to the railways, advancing to him as his needs required, more than $30,000. The line, after a few months of trial and disappointment, was given up as a losing venture. The enterprise, with its property, machinery, &c., subsequently fell into the hands of the First National Bank, its largest creditor. This was in the fall of 1866.

And here we digress, in order to bring up the history of Mr. Henry Harly's pipe line, constructed and completed about this date, from Benninghoff's Run to Shaffer farm.

In the fall of 1865 Mr. Harley began the construction of a pipe line from Benninghoff Run to Shaffer farm ,at that date the termini of the Oil Creek & Allegheny River Railroad. In this undertaking his skill and experience as a civil engineer were of great value to him. The line was constructed amid all sorts of threatening demonstrations from a combination of oil teamsters and lawless men, bent upon destroying whatever seemed inimical to their interests, or that ceased to minister to their wants. The threatenings of these men found open utterance at all points, and these were either privately or publicly endorsed and approved by those who assumed to have, or really cultivated an interest in the well-being of the men whose cause they espoused. Mr. Harley, however, with the same vigor and determination which has characterized him through life, "pushed things," and in the spring of 1866 his enterprise was an acknowledged success, and his efforts universally commended.

While this pipe line was in process of construction the teamsters of Shaffer farm and vicinity, then forming a large fraction of the population of "the creek" between the lower McElhenny farm and Titusville, came to regard Mr. Harley's pipe line, and, indeed, all pipe lines, as legalized robbery, and as infringements upon their rights as common car-

riers—as a fatal blow at their means of livelihood—or, as many of these exasperated, ignorant men expressed it—"an effort to take the bread from the mouths of their children." Of course these lawless combinations had plenty of sympathizers, aiders and abettors, who saw, in the destruction of the business which had drawn so many thither, to engage in "hauling oil," a loss of their own sources of revenue, and hence it is, or was, that Mr. Harley had few friends who dared to avow themselves such, and so he may be said to have been compelled to "go it alone." Threats of vengeance, torrents of abuse and a wild clamor for what these men termed their "rights" greeted him upon every hand. His movements were watched with daily increasing frenzy on the part of the large body of teamsters all about him. There were street brawls and bar-room rows growing out of these pipe line affairs, which finally culminated in an attempt to impede their construction by acts of violence, and a resort to mob law. These infuriated but misguided men set fire to the wooden tanks belonging to Mr. Harley, many of which were filled with oil. They sought to destroy the pipe line by breaking the joints, and by every conceivable device determined to thwart the designs of the enterprising and plucky projector. They sent him letters threatening his certain assassination if he did not abandon his scheme for impoverishing them by ruining their business! Several assaults were made upon the men employed in constructing the line, in which pistols, clubs and stones were freely used, but I believe no lives were sacrificed.

While these lawless demonstrations were transpiring Mr. Harley was not idle. He secured several detectives from New York and elsewhere, made teamsters of them, and they in turn made confidants of their fellows. In less than a week after the adoption of this scheme for the capture of the leaders Mr. Harley had more than twenty of their number under arrest and conveyed to the county jail at Franklin! This strategetic movement demoralized the remainder of the gang, and in ten days afterward more than three hundred teams and teamsters had shaken "the dust from their sandals," and gone hence to return no more. The twenty or more leaders arrested and committed to the county prison at Franklin were kept there for two or three months, when, no one appearing against them, they were discharged, wiser, and I doubt not, better men!

Mr. Harley completed his line from Benninghoff to Shaffer farm, and it was a positive success. It had cost him months of toil and a large amount of money, but all this was of little account when compared to the fearful trials and almost insurmountable embarrassments and determined opposition he had encountered from the people I have mentioned. Going to and from his works with his life in his hands, a price put upon his head, assassination threatened, overt acts committed and the general voice openly or secretly against his enterprise, one can, in a measure at least, comprehend his unenviable surroundings. He, however, found himself ample for the emergency. Turning neither to the right nor to the left to appease the wrath of those who sought his life or threatened the destruction of his property, he completed his enterprise and met his reward in its unqualified success.

In December of 1866 Johathan Watson, a director and creditor of the First National Bank of Titusville, Pa., came into possession of the Van Syckle pipe line, and subsequently disposed of a portion of his interest to William H. Abbott. At that time J. T. Briggs and George S. Stewart, of Titusville, Pa., were running the Van Syckle pipe line in the interest of the First National Bank of Titusville, Pa. In June, 1866, William H. Abbott formed a copartnership in pipe line interests and for the general transaction of the oil trade, with Henry Harley, who had just completed his pipe line from Benninghoff Run to the Shaffer farm on Oil Creek. Messrs. Abbott and Harley at that date owned one-half of the Pit Hole and Miller farm pipe line, and Mr. Harley owned all of the Benninghoff Run pipe line. They believed the Van Syckle pipe line could be made to pay, in connection with the Benninghoff Run pipe line, already in successful operation, and resolved to purchase Mr. Watson's interest and consolidate the two lines, which was done, and thenceforward for sixty or ninety days the business was conducted under the firm name of Abbott & Harley Pipe Lines .

The Western Transportation Company held the only charter granted by the Legislature of the State of Pennsylvania at that period, for piping or transporting oil from the wells to railway stations. This was the charter used for constructing the 5¼-inch pipe line from the Noble well to Shaffer farm, before referred to. As opportunity presented itself Messrs. Abbott & Harley purchased the stock of this company, and in the course of the summer and fall of 1867 found themselves in possession of sufficient of its script to control it all, and their lines were subsequently organized under the old Western Transportation Company's charter ,and took the name of the Allegheny Transportation Company. The following gentlemen were elected as the first board of directors, held January 25 ,1869:

Henry Harley, W. H. Abbott, Joshua Douglass, J. P. Harley and Jay Gould. At a subsequent meeting of the board Mr. Harley was elected President; Mr. Abbott, Secretary; T. W. Larsen, Treasurer, and William Warmcastle, General Superintendent. Mr. Warmcastle was associated with Messrs. Harley & Abbott in one capacity and another ever since these gentlemen commenced their pipe line enterprises, and laid, or superintended the construction of the first two miles of the Benninghoff Run line. Upon the consolidation of Mr. Abbott's and Mr. Harley's interests, and the organization of the Allegheny Transportation Company, in 1867, Mr. Warmcastle was appointed general superintendent, and he continued to hold the position with that uninterrupted relationship of confidence and rare ability always characterizing a faithful discharge of responsible duties.

In 1868 the Allegheny Transportation Company,

having grown into almost colossal importance, and hence understood for "a power" in the oil regions, the attention of the various railway lines to the seaboard were attracted to it, and the president of the Erie Railway Company, Jay Gould, succeeded, in advance of all negotiation, in obtaining control, by purchase, of the valuable interest. With this purchase, which comprised a little more than one-half of the stock, Mr. Harley was appointed to the superintendency of the oil traffic of the Atlantic & Great Western and Erie Railways, with the title of "general oil agent." This responsible position he continued to fill, systematizing its cumbersome and unwieldy proportions, and reducing them to practical business comprehension, as susceptible of control as the simplest problem in mathematics—through the administration of Jay Gould, and he was reappointed to the same position upon the accession of the new management, of which General John A. Dix, ex-Governor of New York, was made president. In May, 1872, he tendered his resignation, his private affairs requiring his attention and presence in Europe. Soon after the acceptance of his resignation, Mr. Harley visited Europe, spending some months abroad, business affairs in the main engrossing his time and attention.

Early in the spring of 1871 the Oil Creek & Allegheny River Railway, impressed with the belief doubtless, that the Allegheny Transportation Company had organized itself so fully and completely in the interests of the Erie Railway Company as to compel it to stand in a position of armed neutrality, if not open hostility to the interests of the former road, threatening seriously their freighting facilities, resolved upon a new pipe line to meet the emergency. A company was organized, under the title of the Commonwealth Oil and Pipe Company, in the interest of the Oil Creek Railroad, and its construction promptly entered upon.

In August of the same year Mr. Harley opened negotiations with the Oil Creek road for the purpose of effecting a combination of interests, and shortly afterward terms were agreed upon, resulting in the organization of the Pennsylvania Transportation Company, with a capital of $1,700,000, owning and operating nearly 500 miles of pipe line, running hither and thither upon the surface of the earth "over mountain and gorge, over rock and plain," here, there and everywhere, in the almost double triangle, made up of Tidioute, Triumph, Irvineton, Oil City, Shamburg ,Pleasantville and Titusville, with the apex at Miller farm.

The new organization at its first meeting elected the following Board of Directors: Henry Harley, W. H. Abbott, Jay Gould, A. R. Williams, J. Douglass, C. B. Wright, U. S. Lane, George K. Anderson and W. H. Kemble. Subsequently Mr. Harley was elected President; Mr. Abbott, Treasurer; T. W. Larsen, Secretary, and Mr. Warmcastle, General Superintendent.

THE FISHER BROTHERS—JOHN J. FISHER, HENRY FISHER AND FREDERICK FISHER.

The Fisher brothers began shipping oil by the river to Pittsburg in 1863, succeeding John Burgess & Co. The three brothers divided their forces, to give each department personal supervision, John J. Fisher managing the buying and shipping at Oil City, and Henry and Frederick receiving and disposing of the cargoes at Pittsburg. Competent men bought crude oil at the wells and handled it in the yards and on the boats. The firm owned a fleet of bulkboats and towboats and acres of barrels. Each barrel was branded with a large letter "F" on both heads. The big "F" was the trade-mark of Fisher Brothers. When railroads were built Fisher Brothers discarded boats and used more barrels than before. When flat cars with two wooden tanks placed on each car were introduced, they adopted them and disposed of the barrels, and later formed a partnership in pipe lines with J. L. and E. B. Grandin and Adnah Neyhart in the Tidioute pipe line. They were also interested in the Tidioute & Dennis Run pipe line, the Pierce & Neyhart, Fisher Brothers and C. W. Ellis pipe line in 1866, and Pierce, Neyhart & Grandin pipe line in 1868. The Tidioute pipe line was the first three-inch pipe line laid by J. L. Grandin, Pierce & Neyhart, Fisher Brothers, C. W. Ellis, M. G. Cushing and James Parshall at Tidioute and Dennis Run, Pa., in 1867. In 1868 J. L. and E. B. Grandin, Fisher Brothers and Adnah Neyhart purchased the remaining interest in the Tidioute pipe line, these gentlemen being from the first its largest stockholders, and in 1869, with David Beatty and John Hunter added to their number, began and completed a pipe line from Fagundas to Trunkeyville, Pa. These pipe lines were successfully operated through the years 1869, 1870 and 1871. At that date the Pennsylvania Transportation Company, the most extensive pipe line incorporated in the oil regions, became interested in them. In November, 1865, the Oil City & Pithole Railroad Company began a railroad from Reno to Rouseville and Pithole, Pa. The work was pushed with such energy that the first train from Reno to Pithole was run on March 10, 1866. Captain J. J. Vandergrift and George V. Forman equipped the Star Tank Line to carry oil in tank cars and laid the Star pipe line from West Pithole to Pithole City, Pa., to connect with the railroad. In 1862 a bill was introduced into the Legislature of Pennsylvania for a pipe line from Oil Creek to Kittanning, Pa., but this and a subsequent scheme for laying a pipe line down the Allegheny River to Pittsburg was strongly opposed and not accomplished for a number of years.

The Venango Transportation Company oil pipe lines, operating on Oil Creek and Franklin, Pa., was organized in 1863-1864, C. V. Culver, President.

The Rochester & Oleopolis Transportation Company of Oil City, Pa., laid a six-inch oil pipe line from Oleopolis to Oil City, Pa., in 1865.

Payne & Martin pipe lines were in operation at Petroleum Center, Pa., in 1866.

The Cherrytree pipe line, from Kane City to Rynd Farm, Pa., was in operation in 1866, and was owned by John Wallace & Co., of Rouseville, Pa.

The Empire Transportation Company was organized in 1867 and laid a number of short pipe lines from the wells to the railroad on Oil Creek.

Vandergrift & Forman were operating the following pipe lines in Pennsylvania in 1867-1868: Pithole & Paxton, Fagundas & Trunkeyville, Shaw Farm & Oil City, Sandy & Oil City, Miller Farm & Oil City, and the Franklin & Oil Creek pipe lines.

The first free oil pipe line bill was introduced in the Legsilature of Pennsylvania in 1868, and the Legislature, by consent of Thomas A. Scott, at that date vice president of the Pennsylvania Railroad, permitted the bill to pass, giving the right of free pipe lines in eight counties of Pennsylvania, as follows: Allegheny, Armstrong, Butler, Clarion, Crawford, Forest, Venango and Warren, with a proviso that no pipe line should enter Pittsburg or Allegheny, Pa. This proviso was put in to keep the pipe line owners from shipping oil over the Baltimore & Ohio Railroad. This is a sample of the justice the people of Pennsylvania received while Thomas A. Scott was their political dictator and lobbyist.

Stephen D. Karns laid the first pipe line from Parker's Landing, Pa., to the railroad on the opposite side of the Allegheny River in 1868. In the spring of 1869 Fullerton Parker joined Stephen D. Karns in building pipe lines under the name of the Karns & Parker Pipe Line. During the summer of 1869 Parker, Thompson & Co. laid a pipe line as a competitor to the Karns & Parker Pipe Lines, and after a year or more of rivalry and competition the two pipe lines were united under the name of the Union Pipe Line.

The Grant Pipe Line Company was organized at Parker's Landing, Pa., in 1870, Colonel R. B. Allen, President.

The Emlenton Pipe Line was laid from Upper Turkey Run to Emlenton, Pa., in 1871.

The Antwerp Pipe Line, from Upper Turkey, Pa., was laid in 1871.

The Octave Pipe Line was organized at Titusville, Pa., in July, 1871; M. Stewart, President; J. E. Blake, Vice President; D. O. Wickham, Secretary; O. G. Emery, Treasurer; D. Emery and L. Emery, Jr., Directors.

The Fairview Pipe Line, from Fairview to Karns City, Pa., in 1872.

Relief Pipe Line, from Petrolia, Karns City and Parker's Landing, Pa., in 1872.

The Butler Pipe Line, from Butler county oil fields to the loading rack on Allegheny Valley Railroad at Parker's Landing in 1872.

The Cleveland Pipe Line Company ,S. D. Karns, owner, from Karns City and Petrolia to Parker's Landing, Pa., was laid in 1873.

The Mutual Pipe Line Company, operating in Venango, Armstrong, Clarion and Butler counties, Pa., in 1871.

The free pipe line bill passed both houses of the Legislature of Pennsylvania March 13, 1872. The Legislature on the 18th of March, 1872, passed a bill repealing the Scott proviso, which allowed free pipe lines in only eight counties of Pennsylvania.

In 1872 the American Transfer Company began to build and acquire by purchase pipe lines on Oil Creek and in the lower oil fields. This was the first Standard Oil Company pipe line.

J. H. Dilks organized the Olean Petroleum Company in 1873, with headquarters at Olean, N. Y. A pipe line from the Bradford oil field was laid and the first oil was pumped from Bradford to Olean on Thanksgiving Day, 1873.

In 1873 the Union Pipe Line Company acquired a number of pipe lines and operated its system in connection with the Empire Pipe Line.

The Legislature of Pennsylvania in May, 1874, passed the pipe line bill, regulating the pipe line companies and ordering them to make monthly statements of runs, stocks, receipts, etc.

In 1874, the Vandergrift and Foreman and the Mutual pipe lines consolidated, under the name of the United Pipe Lines.

The growth of the pipe lines up to and including the spring of 1874 was wonderful. Short pipe lines multiplied, and one after another was built from the producing wells to the oil refineries and railroad shipping points, and crossed and paralleled one another in every direction. Competing companies waged war upon one another, cutting rates to the point of doing business at an actual loss. When the producer had run his oil into the storage tanks of some of these concerns he was not certain whether the certificates received (for they all issued certificates instead of paying cash for oil) had any value; yet the producer had either to run his oil through the pipe line that was connected to his tank or quit producing the oil. These badly managed competitive pipe line companies were the direct cause of the Vandergrift and Foreman and the Mutual Pipe Lines consolidating in one united pipe line system.

The Columbia Conduit Pipe Line was built in 1875, and was the first four-inch trunk pipe line extending from Millertown to Pittsburg, Pa., a distance of sixty miles. The line was owned by Dr. Hostetter, of Pittsburg, Pa.

The Union Pipe Line Company pumped its first oil from the Bradford, Pa., oil field to Olean, N. Y., November 23rd, 1875.

The Olean Pipe Line Company was succeeded by The Empire Transportation Company, owned by the Pennsylvania Railroad Company, in 1876.

The Warren Pipe Line was constructed in 1876 from the David Beatty farm, in East Warren, to a loading rack on the Dunkirk, Allegheny Valley & Pittsburg Railroad, at West End, Warren, Pa. David Beatty was owner.

The first pipe lines in the Bradford, McKean county, Pa., oil field, were the McKean County Pipe Line, the Olean Petroleum Pipe Line, the Empire Pipe Line and the American Transfer Pipe Line.

The United Pipe Lines, into which numerous smaller pipe lines were merged into one grand division or association, was the first step taken in the direction of settling the question of oil transportation by pipe lines for all time. The advantages of the consolidation quickly commended the new order of things to the public. The United Pipe Lines erected hundreds of 35,000 barrel oil tanks to store the over-supply of oil, made pipe line connections to all of the tanks at the wells and built pump stations where they were needed to handle the oil. The best pumps and appliances were adopted in improving the service and diminishing its cost. Uniform rates were established, and every detail was systematized. The United Pipe Lines Association moved forward steadily, avoiding the faults that had wrecked other pipe lines. It bought or combined the Oil City pipe line, the Antwerp pipe line, the Union pipe line, the Cleveland (Karns) pipe line, the Grant pipe line and the Columbia Conduit pipe line, the Relief pipe line, the Pennsylvania Transportation Co., Clarion division of the American Transfer Co., the Prentice pipe line and the Warren pipe line.

The American Transfer Company published the following notice:—

BRADFORD, PA., October 31, 1872.

"Notice is hereby given to patrons of the American Transfer Company that all losses sustained on oil on account of lightning, fire or other unavoidable causes, will be charged to parties holding oil in the custody of the company, whether said oil is to their credit on the books of the company or in certificate *pro rata* upon the principles of general average.

DAN. O'DAY,
Superintendent American Transfer Co.

A bill to repeal the Free Pipe Line laws was introduced in the Legislature of Pennsylvania by Representative Marshall in 1878, and was defeated. The Free Pipe Line Bill passed the House in the Legislature of Pennsylvania April 23, 1878.

The Tide Water Pipe Co., Ltd., was organized and began business in the Bradford, McKean county, Pa., oil field in 1878. The officers were: Samuel Q. Brown, president; W. S. Benson, secretary; A. A. Sumner, treasurer; James Alden, purchasing agent. General office, Bowling Green Building, 11 Broadway, New York. In the fall of 1878 the Tide Water Pipe Co., Ltd., began laying a six-inch pipe line from their main field supply pump station at Rixford, Pa., to Muncy Station, Pa., oil loading rack on the Philadelphia & Reading railroad. This section was completed in May, 1879. The second section was laid to Tamanend, Pa., in August, 1882, and was completed to the seaboard at Bayonne, N. J., in June, 1887.

In 1879 the United Pipe Lines bought the stock and interests of the Empire Transportation Company owned by the Pennsylvania Railroad Company in the upper and middle oil fields and began the erection of 35,000-barrel iron storage tanks. At one time there were in the vicinity of Olean, N. Y., 300 iron oil tanks, having a capacity of 9,000,000 barrels of oil in storage.

The pipe lines in 1879 were: The Smith's Ferry Transportation Company, the West Virginia Transportation Company, George Rice Pipe Line, American Transfer Company, United Pipe Lines, Tidewater Pipe Company, Ltd., Tidioute & Titusville Pipe Line, Franklin Pipe Line, Octave Oil Company Pipe Line, Fox Farm Pipe Line, Shaffer & Charley Run Pipe Line, T. C. Joy Pipe Line, Pennsylvania Transportation Company, Church Run Pipe Line, Cherrytree Pipe Line, Emlenton Pipe Line, Keystone Pipe Line and Associated Pipe Lines.

UNITED PIPE LINES,
Oil City, Pa., May 1, 1879.

Notice:

On and after Thursday, May 1, 1879, transportation charges will be collected in advance on all acceptances furnished by the United Pipe Lines; also upon all transfer orders deposited for credit, making all oil leaving first hands on and after the above date pipeage paid instead of unpaid, as heretofore, in order to accommodate the trade. Exceptions will be made to this rule in cases of contracts for future delivery of pipeage, unpaid oil, provided such contracts have been made prior to the date of this notice, all pro rata assessments made to cover losses of oil occurring after April 30, 1879, will be payable in oil, pipeage paid.

Per order of the Executive Committee,
E. HOPKINS,
General Manager.

PETROLEUM PRODUCERS' UNION.

To the General Council of the Petroleum Producers' Union the following report is submitted in compliance with the resolution of the council, passed July 20th, 1880, in these words:

Resolved, That the Committee on Legal Remedies be and hereby is directed to report the proceedings of their work since the commencement of legal proceedings on behalf of the council against transportation companies of Pennsylvania. On February 18th, 1880, President Benj. B. Campell, of the Petroleum Producers' Union, in a suit against the United Pipe Lines, while a review of the evidence was being held in the United States Court, held in Pittsburg, Pa., February 18th, 1880, the Standard Oil Company, owners of the United Pipe Lines, offered the president of the Petroleum Producers' Union a sum of money to drop all the suits pending against the transportation companies and the Standard Oil Company in general in the State of Pennsylvania. The money to be applied as follows: In payment of court cases, refunding to all subscribers their contributions to the fund raised for the expense of the legal proceedings, payment of the attorneys, and the remainder, if any, to be returned to the Standard Oil

Company. From the facts in the case, it is true that the president of the Petroleum Producers' Union did on the 18th day of February, 1880, accept from the Standard Oil Company a large sum of money, as per agreement, to withdraw all suits at law against said company. All costs and other bills were paid as agreed upon, with a large belance left, which was not returned to the Standard Oil Company, as per agreement.

This report was made to the general council of the Petroleum Producers' Union held at Bradford, Pa., August 10th, 1880.

Attested:

E. BREWER,
Secretary Pro Tem.

The business of the American Transfer Company in McKean county, Pa., was transferred to the United Pipe Lines, November 20th, 1880; Dan O'Day, Superintendent, E. Hopkins, General Manager.

The management of the United Pipe Lines in 1880 was as follows: Capt. J. J. Vandergrift, President; J. R. Campbell, Treasurer; Edward Hopkins, Manager; Dan O'Day, Superintendent.

The pipe lines in 1883 were the United, Ohio Transit, West Virginia Transportation Company, Tide Water, Emery, Equitable, Monongahela, McKinney Bros., Union Oil Company, and McCalmont Oil Company. In 1883 the McKinney Bros. and the McCalmont Oil Company's pipe lines were acquired through purchase by the United Pipe Lines.

From 1870 up to 1884 the production of crude oil was each year greatly in excess of its consumption for all purposes. Consequently oil accumulated and was stored in iron tanks at Colegrove, Tiona, Warren, Oil City, Parkers Landing, Pennsylvania, and Olean, N. Y. In August, 1884, this accumulated crude oil reached the enormous maximum amount of 39,083,464 barrels of oil above ground. The oil in over production was valued, in 1884, at $40,000,000.

The United Pipe Lines operated under three divisions, the Upper or McKean Co. division; the Middle division from Warren to Franklin, Pa., and the Lower division—Clarion, Armstrong, Butler and Allegheny county, Pa. On May 12, 1884, the United pipe lines were transferred to the National Transit Company and the three divisions were merged into one grand division of the United Pipe Lines division of the National Transit Company. The National Transit Company operates under the original charter granted Andrew Howard, J. S. Swartz and others employed as "lobbies" by the Pennsylvania Railroad Company. This is one of the fifteen charters granted a gang of Pennsylvania railroad lobbyists by the legislature of Pennsylvania April 7, 1870. This charter is known as the Pennsylvania Company, or No. 5, and is identically the same as the South Improvement Company, known as No. 2. By the terms of those charters, if carried out, the Pennsylvania Railroad Company would have been lord and master over all things, with the United States Government under its control. Such was the ambition of Thomas A. Scott, the political anaconda of the Pennsylvania Railroad Company.

The following is a correct and true copy of the South Improvement and Pennsylvania Company charter:

CHARTER OF THE SOUTH IMPROVEMENT COMPANY.

AN ACT TO INCORPORATE THE SOUTH IMPROVEMENT COMPANY.

Section 1. Be it enacted by the senate and house of representatives of the Commonwealth of Pennsylvania in general assembly met, and it is hereby enacted by the authority of the same, That S. S. Moon, R. D. Barclay, John A. Fowler, or a majority of them, their associates, successors, and assigns, be, and they are hereby authorized and empowered to form and be a body corporate, to be known as the South Improvement Company, which shall be, and is hereby, vested with all the powers, privileges, duties, and obligations conferred upon the act to corporate the Pennsylvania Company, by the act of the legislature of Pennsylvania, approved the 7th day of April, A. D. 1870, and the supplement thereto.

Section 2. That the stockholders of said company, by and with the consent of the holders of not less than two-thirds of the shares of stock, be, and they are hereby, authorized to change the name and title of the said company and designate the location of its general office, which changes shall be valid after the filing of a certain certificate in the office of the secretary of the Commonwealth, signed by the president and attested by the seal of the said company.

JAMES H. WEBB,
Speaker of the House of Representatives.

WILLIAM A. WALLACE,
Speaker of the Senate.

Approved the 6th day of May, A. D., 1871.

JOHN W. GEARY,
Secretary.

CHARTER OF THE PENNSYLVANIA COMPANY.

AN ACT TO INCORPORATE THE PENNSYLVANIA COMPANY.

Section 1. Be it enacted by the senate and house of representatives of the Commonwealth of Pennsylvania in general assembly met, and it is hereby enacted by authority of the same, That Andrew Howard, Jr., S. Swartz, G. B Edward, J. D. Wellsto, and J. T. Malin, their associates, successors, and

assigns, or a majority of them be, and they are hereby, authorized to form and be a body corporate, to be known as the Pennsylvania Company, and by that name, style, and title shall have perpetual succession and all the privileges, franchises, and immunities incident to a corporation; may sue and be sued, implead and be impleaded, complain and defend in all courts of law and equity, of record and otherwise; may purchase, receive, hold, and enjoy, to them, their successors, and assigns, all such lands, tenements, and leaseholds, estates and hereditaments, goods and chattels, securities and estates, real, personal, and mixed, of what kind and quality soever, as may be necessary to erect depots, engine houses, tracks, shops, and other purposes of said corporation, as hereafter defined by the second section of this act; and the same from time to time may sell, convey, mortgage, encumber, charge, pledge, grant, lease, sublease, alien and dispose of, and also make and have a common seal, and the same to alter and renew at pleasure, and ordain, establish and put in execution such by-laws or ordinances, rules and regulations as may be necessary or convenient for the government of the said corporation, not being contrary to the constitution and laws of this Commonwealth, and generally may do all and singular the matters and things which to them shall appertain to do for the well-being of the said corporation and the management and ordering of the affairs and business of the same; Provided, That nothing herein contained shall be so construed as to give to the said corporation any banking privileges or franchises or the privilege of issuing their obligations as money.

Section 2. That the corporation hereby created shall have power to contract with any person or persons, firms, corporations, or any other party, howsoever formed, existing, or that may hereafter exist, in any way that said parties, or any of them may have authority to do, to build, construct, maintain, or manage any work or works, public or private which may tend or be designed to include, increase, facilitate, or develop trade, travel, or the transportation or conveyance of freight, live stock, passengers, or any trade traffic, by land or water, from or to any part of the United States or the Territories thereof; and the said company shall also have power and authority to supply or furnish all needful materials, labor, implements, instruments and fixtures of any kind whatsoever, on such terms and conditions as may be agreed upon between the parties, respectively, and also to purchase, erect, construct, maintain, or conduct, in its own name and for its own benefit, or otherwise, any such work, public or private,as they may by law be authorized to do (including also hiring lines for telegraphic communication), and to aid, co-operate, and unite with any company, person or firm in so doing.

Section 4. The company hereby created, shall also have power to enter upon and occupy the lands of individuals or of companies on making payment therefor or giving security according to law for the purpose of erecting, constructing, maintaining, or managing any public work, such as is provided for or mentioned in the second section of this act, and to construct and erect such works thereon, and also such buildings, improvements, structures, roads, or fixtures as may be necessary or convenient for the purposes of said company, under the powers herein granted; and to purchase, make, use, and maintain any works or improvements connecting or intended to be connected with the works of the said company; and to merge or consolidate or unite with the said franchises of any other company or companies on such terms and conditions as the said company may agree upon; and to fix and regulate the tolls or charges to be charged or demanded for any freight, property, or passengers traveling or passing over any improvement erected, managed, or owned by the said company, or on any merchandise or property transported over any road whatever by the said company, and to make, from time to time, dividends from the profits made by the said company; the several railroads managed by said company shall continue taxable, as heretofore, in proportion to their length within this State, respectively; and the said Pennsylvania Company shall be taxable only on the proportion of dividends on its capital stock and upon net earnings or income, only in proportion to the amount actually carried by it within the State of Pennsylvania, and on its earnings or income derived from its business beyond the limits of this Commonwealth shall not be liable for taxation.

HOW THE NATIONAL TRANSIT COMPANY (STANDARD OIL COMPANY) GOT THE CORPORATE POWERS WHICH THE SOUTH IMPROVEMENT COMPANY WERE GRANTED.

"An Act to Incorporate the Overland Contract Company was approved March 22, 1871."

That is the act for transporting oil by pipe line throughout the State of Pennsylvania; and the provisions of the Southern Railway Security act, or the Overland Contract Company act, are the same as the Pennsylvania Company, or the South Improvement Company act, identically. It is simply the same act with another head.

The National Transit Company bought the Pennsylvania Company charter,under which the National Transit Company is organized, March 8, 1881, for $16,250.

The present Free Pipe Line Bill was introduced in the Senate of Pennsylvania by Senator Lewis Emery, Jr.,from Bradford, Pa., in 1883, and was passed in the same year.

The first pipe line in Lima, Ohio, was the Edwards Pipe Line, which began buying Lima oil in April 1886, at 40 cents a barrel. On May 1, 1886, the Buckeye Pipe Line (branch of the Standard Oil Company) began the building of a 35,000 barrel iron oil storage tank on the Ben. C. Faurot lands

Southwest, Lima, O., and on May 11, 1886, commenced buying Lima oil in the field at 40 cents a barrel, and on the 1st of June, 1886, began to build the Solar refinery near the C. & A. railroad at South Lima, Ohio.

The Billingsly Pipe Line Bill was introduced into the legislature of Pennsylvania in 1887 by Representative Billingsly of Washington county, Pa.

THE WESTERN AND ATLANTIC PIPE LINE.

W. & A. P. L.

Joseph H. Craig, President and General Manager. The line was known as the W. & A. and the Craig-Elkins & Kimble Company. This company began building pipe lines in the Washington and Taylorstown oil fields in 1887. Storage tanks were first built near the Baltimore & Ohio railroad at Washington and Taylorstown, Pa. In the spring of 1888 they began laying pipe lines in Armstrong, Allegheny, Beaver and Butler counties, Pa., and built storage tanks and oil loading racks on the Pittsburg and Western (Baltimore and Ohio) railroad near Mars, Pa. The Western and Atlantic Pipe Line sold their pipe lines, storage tanks and loading racks to the National Transit Company (Standard Oil Company) in December, 1889.

The Eureka Pipe Line Company, principal office Oil City, Pa.; chartered under the laws of West Virginia, December 22, 1890; authorized capital, $2,000,000; par value shares, $100; amount paid in, $100,000. Incorporators: Daniel O'Day, Buffalo, N. Y.; C. N. Payne, Titusville, Pa.; C. W. Archbold, Parkersburg, W. Va.; H. W. Sweeny, Oil City, Pa.; J. R. Campbell, Oil City, Pa .

The W. L. Mellon Pipe Line, known as the Craig-Mellon Line, was organized in 1892, and began laying a pipe line from their pump station and storage tanks at Hay's Station(near Greggs), Allegheny county, Pa., to the McCurdy, Oakdale and McDonald, Pa., oil field. In the spring of 1893 the Mellon line began building storage tanks and a pump station on the Wells flats at Sistersville, W. Va., and a five-inch line was laid from Sistersville, W. Va., to Hay's Station, Pa., and in 1893 they built the Crescent Pipe Line, a five-inch trunk line, from Hay's Station to Philadelphia, Pa. In 1895 the Mellon Pipe Line sold their entire interests in pipe lines to the National Transit Co. (Standard Oil Co.)

The pipe lines in 1893 were:—

The National Transit Co, United Pipe Lines Division, six and eight-inch trunk lines from Bear Creek, Pa., to Olean, N. Y.

Bear Creek, Armstrong county, Pa., to Crown, Clarion county, Pa., 28 miles.

Crown, Clarion county, Pa., to Kane, McKean county, Pa., 35 miles.

Kane, McKean county, Pa., to Colegrove, McKean county, Pa., 22 miles.

Colegrove, McKean county, Pa., to Olean, Cattaraugus county, N. Y., 30 miles.

Kane, McKean county, Pa., direct line to Olean, Cattaraugus county, N. Y., 35 miles.

The Buffalo line is about 56 miles long, having its initial point at Olean, N. Y.. It is four-inch pipe. The New York line consists of two six-inch pipes starting at Olean, N. Y., and running parallel to each other through the southern counties of New York State to Saddle River, N. J., where the lines separate; one going down to the refineries at Bayonne, N. J., and the other going under the North and East rivers to the refineries at Hunter's Point, on Long Island. In addition to the two parallel six-inch lines, the New York line is looped at many of the stations; that is, extra lines are put in to relieve the pressure on the other lines and so increase somewhat their capacity; thus making the total length of pipe used 762 miles, the distance traversed by the line being 313 miles.

The Tide Water line of six-inch pipe, extends from Rixford in McKean county, to the refinery of the Tide Water Oil Company, Limited, at Bayonne, N. J., a distance of 284 miles.

The Southern Trunk line starts from Morgantown, W. Va., and extends to Philadelphia, a distance of 274 miles. This line is composed of six-inch and eight-inch pipe, the total length of pipe being about 364 miles.

We give below a table showing the actual length of each trunk line. In addition to this there are many other large lines connecting the various systems and different oil fields.

For example: Between Kane and Bear Creek, a distance of 63 miles, there are five six-inch lines; from Kane to Colgrove, there are 22 miles of eight-inch pipe; from Colegrove to Olean, 30 miles of eight-inch pipe. The total pipe, including these large connecting lines and the double lines and loops, amounts to 3,000 miles.

Pittsburg Pipe Line, four-inch pipe:—		Miles.
Bear Creek to Pittsburg		55
Buffalo Line, four-inch pipe:—		
Olean to Buffalo		56.25
Cleveland Pipe Line, five-inch pipe:—	Miles.	
Bear Creek to Simpson	29.81	
Simpson to Warren	30.23	
Warren to Mantua	22.16	
Mantua to Cleveland	28.59	110.79
Philadelphia Pipe Line, six-inch pipe:	Miles.	
Colegrove to Hunt's Run	23.41	
Hunt's Run to North Point	25.90	
North Point to Pine	25.73	
Pine to Latshaw	45.40	
Latshaw to Millway	51.94	
Millway to Philadelphia	62.50	234.88
Baltimore Pipe Line, five-inch pipe:—		
Millway to Baltimore		65.80

New York Pipe Line, six-inch pipe:—	Miles.	
Olean to Wellsville	28.54	
Wellsville to Cameron Mills	27.91	
Cameron Mills to West Junction	29.74	
West Junction to Catatonk	27.37	
Catatonk to Osborne Hollow	27.99	
Osborne Hollow to Hancock	29.86	
Hancock to Cochecton	26.22	
Cochecton to Swartwont	28.94	
Swartwont to Newfoundland	29.00	
Newfoundland to Saddle River	28.77	
Saddle River to Bayonne, N. J.	16.29	
Saddle River to Hunter's Point, N. Y.	12.26	
Total (with loopings)		762.01

Tide Water Pipe Line, six-inch pipe:—	Miles.	
Rixford to Olmstead	28.7	
Olmstead to County Line	36.0	
County Line to Muncy	53.5	
Muncy to Shuman	33.9	
Shuman to Hudsondale	27.65	
Hudsondale to Changewater	52.5	
Changewater to Bayonne, N. J.	51.5	—283.75

Southern Pipe Line, eight-inch and six-inch pipe:—	Miles.	
Morgantown to Watson	33.88	
Watson to State Line	35.82	
State Line to Knepper	66.67	
Knepper to Millway	75.42	
Millway to Philadelphia	62.50	
Total (with loopings)		364.29

Crescent Pipe Line (Mellon Line) five-inch pipe:—	Miles.	
Greggs to Milbank	about 48	
Milbank to Ingleside	" 24	
Ingleside to Saxton	" 30	
Saxton to Mount Holly	" 55	
Mount Holly to Florinal	" 40	
Florinal to Linwood	" 60	—267

United States Pipe Line (Emery Line), double line, four-inch and five-inch pipe:—	Miles.	
Titusville to Tarport	about 65	
Tarport to Westfield	" 60	
Westfield to Athens	" 55	
Total (two lines)		360

The trunk lines carrying Pennsylvania crude are nearly 3,000 miles in length; but this does not include the network of two-inch pipes that fairly cover the producing country, and serve as feeders for the trunk lines. A representative of the Standard Oil Company appearing before a committee of the State Legislature, in February, 1891, testified that the total length of lines transporting Pennsylvania crude was undoubtedly 25,000 miles; or, as one of the senators put it, "a girdle for the earth."

The lines are usually laid under ground with bends, at intervals, to allow for expansion and contraction. The pipe for these trunk lines is made especially for them. It is wrought iron, lap welded, and comes in lengths of 18 feet. On each end coarse and sharp taper threads are cut, nine to the inch, and the lengths are connected with long sleeve couplings, also screwed taper. The pipe is tested to stand a pressure of 2,000 pounds to the square inch, made necessary by the tremendous pressure carried on some of the pumps. This is sometimes as high as 1,500 pounds. It can be appreciated by remembering that, in addition to overcoming the friction of the oil on the line, which increases enormously as the rapidity of the flow is increased, the large body of liquid is made to move with great speed. It was found that the friction on the 108 miles of six-inch pipe between Rixford and Williamsport, Pa., was equal to a column of oil 700 feet high—that is, had this line had a gradual descent amounting to 700 feet, the adhesion between the oil and pipe would have prevented any flow, with the pipe full of oil for the 108 miles.

At each station there are two or more storage tanks from 30,000 to 35,000 barrels capacity, the oil being received from the station next before into one of the tanks, while the pump is emptying another. In this way the movement of oil through the trunk lines is made incessant. Most of the stations are also provided with duplicate pumping machinery so that there need be no interruption of the flow of oil even when one pump has to be stopped for repairs. The distance between stations averages 28 to 30 miles, but loops are sometimes laid around a station so that one pump has moved oil as far as 110 miles.

Where the New York trunk line passes under the Hudson river it is double—that is, one pipe is placed inside of another with tight fitting sleeve joints. The jacket pipe has its ends separated by a space of 12 inches to permit the enclosed pipe to be screwed home. The sleeve is then pushed over the 12-inch gap, and the whole space between the pipes is filled with lead poured in melted. The line is held in place on the bottom of the river by two sets of heavy chains parallel with the pipe and about twenty-five feet from it, one on each side. Every 300 feet a guide chain connects the pipe with these lateral chains, and beyond each one of these connections an anchor, weighing over a ton, keeps the whole in place. The line crossing the salt marshes approaching the river is laid in a rectangular wooden box, filled with hydraulic cement to withstand corrosion.

Pipe Line Pumps.—The pumps employed for this severe service are magnificent machines. The National Transit Company have been building their own pumps, constructing for trunk line service enormous triple expansion crank and fly wheel engines, which are superseding other makes of pumps on their lines. At each station there is generally one of these high-duty engines and a low-duty one for relief or emergency service. Most of the pumping is done by the machine just described, the other being employed when the main pump is being repaired or adjusted.

A station equipped with a high-service pump has also seven or eight horizontal tubular boilers, 80 to 100 horse power each. Six of the boilers are fired at once. They are placed in a boiler-house 40 feet square, built

of brick and coverd with a corrugated iron roof. The pumps are in a separate brick building, being separated for greater safety from fire. The stations are lighted by electricity, as the pump never stops moving the oil forward every day and night in the year. The stations are connected with one another and with the main offices of the pipe lines by independent telegraph wires. When a producer's tank is measured and accepted by a gauger and the oil passed into the pipe line, a report is telegraphed to the central station of that section of the field. A complete record of the capacity of each tank in the field is here kept by which the feet and inches of the oil indicated by the despatch are at once converted into barrels and placed to the credit of the producer on the books of the pipe line. By this means, at the end of each day, an accurate return can be made of the oil received; which, checked by an equally accurate report of the oil delivered, enables the pipe line to know their stocks at all times.

At each station there are two or more receiving or storage tanks built of light boiler iron; the usual size being about 90 feet in diameter, and 30 feet high. These tanks have conical roofs of wood covered with No. 20 iron. Each tank holds about 30,000 barrels of oil. A general idea of the plan of construction of storage tanks can be learned from the following specifications under which the tanks of many of the pipe lines are built:—

SPECIFICATIONS OF IRON STORAGE TANKS.

Capacity (Barrels of 42 Gallons Each) About	1,000	2,000	3,000	4,000	5,000	10,000	15,000	20,000	25,000	30,000	35,000
Diameter of tank, in feet	30	30	30	35	43	54	66	78	86	86	92
Height of tank, in feet	8	16	24	34	20	25	25	25	25	30	30
Number of rings in shell	3	4	5	5	4	6	6	6	6	7	7
Thickness of ring (Birmingham gauge)	No. 7	No. 5	No. 3	No 3	No. 3	No. 3	No. 3	No. 3	No. 1	No. 0	No.00
Thickness of second ring	No. 8	No. 6	No. 4	No. 4	No. 4	No. 3	No. 3	No. 3	No. 2	No. 1	No. 0
Thickness of third ring	.....	No. 7	No. 5	No. 5	No. 5	No. 4	No. 4	No. 4	No. 3	No. 2	No. 1
Thickness of fourth ring	.....	No. 8	No. 6	No. 6	No. 6	No 5	No. 5	No. 5	No. 4	No. 3	No. 2
Thickness of fifth ring	.....	.....	No. 7	No. 7	.....	No. 6	No. 6	No. 6	No. 5	No. 4	No. 3
Thickness of sixth ring	.....	.....	.....	.....	.....	No. 7	No 7	No. 7	No. 6	No. 5	No. 4
Thickness of seventh ring	.....	.....	.....	.....	.....	.....	.....	.....	.....	No. 6	No. 6
Thickness of bottom plates	No. 7	No. 7	No. 7	No. 7	No. 7	No. 7	No. 6	No. 6	No. 6	No. 6	No. 6
Thickness of sketch plates	No. 7	No. 7	No. 7	No. 7	No. 7	No. 7	No. 6	No. 6	No. 6	No. 6	No. 5
Size of bottom angle iron, in inches	2½x2½x5-16	2¼x2¼x5-16	2½x2½x5-16	2½x2½x⅜	2½x2½x⅜	2½x2½x⅜	3x3x⅜	3x3x⅜	3x3x⅜	4x4x½	4x4x½
Size of top angle iron, in inches	2x2x¼	2x2x¼	2x2x¼	2x2x¼	2x2x¼	2x2x¼	2x2x¼	2x2x¼	2x2x¼	2x2x¼	2x2x⅜
Thickness of sheets for light nailed roof	No. 20	No. 20	No. 20	No. 20	No. 20	No. 20	No. 20	No. 20	No. 20	No. 20	No. 20
Thickness of sheets for tight riveted roof	No. 12	No. 12	No. 12	No. 12	No. 12	No. 12	No. 12	No. 12	No. 12	No. 12	No. 12

Cleaning Pipe Lines.—All crude petroleum contains more or less amorphous or uncrystallized paraffine or wax. Water mixed with crude oil forms an emulsion or soapy deposit. The paraffine is known in the oil region as "sucker-rod wax," because it collects on the rods used for pumping wells. The emulsion is locally known as "B. S." These two sediments, together with the impurities naturally incident to the producing of petroleum and its transfer from point to point, gradually choke the pipe lines, particularly in colder weather. To clean them, a curious instrument called a "go-devil" is sent through the pipe. These scrapers or brushes have at different times been of various designs, the one now used being the improved instrument that experience has shown is best suited to the work. It is a spindle with a ball and socket joint near its center so that it can follow the bends in the pipe. This spindle is fitted with steel blades set radially. It is kept in position in the pipe by three arms both in front and rear, with a guide wheel on the end of each arm. Oblique vanes put in motion by the moving oil rotate the spindle and the steel blades scrape the pipe. | At the rear end of the "go-devil" a piston that approximately fits the pipe, gives the instrument a forward motion, being impelled by the oil pumped through the line. Until within a few years, it was customary for men to follow the scraper in its trip, knowing where it was by the whirring noise it made; any obstacle being located by the stopping of the "go-devil." This is no longer thought necessary. A catch-box is placed at the other end of the line, and the time of the trip is so well known that the arrival of the little traveler can be closely timed. But the lines are regularly patrolled to promptly detect any leaks, although the system of checking from tank to tank makes it impossible for any serious break to occur without detection.

Oil Loading Racks—Closely associated with the pipe lines in such a description as this should be the loading racks for filling cars on railroad sidings. There are very many of these, both in the oil region and at different points along the main trunk lines, and at their termini. From one car to an entire train of thirty to forty cars can be loaded at once at many of these racks. The construction is of the simplest character; and, in general, the same at all points. Perpendicular branches are carried up at intervals, equal to the length of a tank car, from the main oil line, which is run along the side of the track. These branches are each provided with a stopcock and a movable pipe of proper length to reach over the dome of the tank car standing on the track; when moved into that position by a man passing from one of these upright branches to another, on a platform that has been erected at a convenient height. When the train of cars has been pushed into place on the track, these movable pipes are put over the platform down into the domes of the cars and the oil turned on. As many cars as the side track will hold can thus be loaded at the same time.

Pipe Line Companies.—The trunk lines are con-

trolled by the National Transit Company; the Tide-Water Pipe Company, Limited; the Octave Pipe Line; the Southwestern Pennsylvania Pipe Lines; the Eureka Pipe Line Company; the Buckeye Pipe Line Company; the Southern Pipe Line Company; the Charles Miller Pipe Line; the Western and Atlantic Pipe Line; the Elk Pipe Line; the Crescent Pipe Line (Mellon Line); the Producers' Pipe Line; the Producers' and Refiners' Oil Company, Limited; the United States Pipe Line (Emery Line), and the New York Transit Company. The first two mentioned are the most important. These companies moved the oil from the region to the terminus of their lines. The National Transit Company does a very large proportion of the entire business. It holds the original charter granted to Andrew Howard and J. S. Swartz and others under the name of the Pennsylvania Company, by the Act of April 7, 1870. The Pennsylvania Company charter is the same as the South Improvement charter. In 1880, it absorbed the business and plant of the American Transfer Company; and, on April 1, 1884, the business and plant of the United Pipe Lines—that branch of the organization being since known as the United Pipe Lines Division of the National Transit Company.

Pipe Line Certificates.—The National Transit Company and the Tide-Water Pipe Company, Limited, United States Pipe Line, Producers' and Refiners' Pipe Line, Guffey Petroleum Company, Higgins Pipe Line and other lines issue certificates for crude petroleum received. These are printed acceptances for crude, and are negotiable the same as a certified check. We give here a copy of a certificate of the National Transit Company.

Acceptance.

No..... OIL CITY, PA.,.....18..

NATIONAL TRANSIT COMPANY, (1,000)

Through its UNITED PIPE LINES division,

Deliver to .....or order,

ONE THOUSAND BARRELS of crude petroleum (of 42 gallons each) on the following terms, which are agreed to by the holder hereof:

1. It is agreed that the petroleum mentioned in this order is held by the National Transit Company, subject to a transportation charge of twenty cents per barrel, and a storage charge which will be at the rate of twenty-five cents per day per thousand barrels, as long as the market price of certificate oil is below one dollar per barrel; thirty-five cents per day when the market price is from one dollar to one dollar and fifty cents per barrel, and forty cents per day when the market price is above one dollar and fifty cents per barrel; no charge, however, to be made in rate of storage on account of prices going above or below the prices named, unless the market price remains above or below the specified point for thirty consecutive days, and that the point of delivery of such oil shall be within the United Pipe Lines division.

Not good until accepted by.....Agent at.....

2. It is further agreed that this order shall be returned to the National Transit Company for exchange within six months from date of issue, or be subject to a storage charge of one-twentieth (1-20) of one cent per barrel daily thereafter until returned.

3. It is further agreed that the National Transit Company shall not, in any event, be liable for any loss of crude petroleum, resulting from lightning, fire, storms or any other unavoidable causes, it being distinctly understood and agreed that any such loss or losses shall be charged *pro rata* upon all petroleum in its custody at the time of such loss or destruction, and that the quantity of petroleum called for by this order shall be reduced by its proportion of such loss or destruction.

4. It is further agreed that transportation and all accrued storage charges shall be paid on the amount so deducted.

Order Accepted.

No.....Agent.....Registrar

The system of issuing these certificates is, briefly, as follows:—

When a producer wishes to deliver oil from his tank, he notifies a gauger of the pipe line, who measures oil and gives a voucher for it, running it into the line. The oil thus received is treated the same as a deposit in a bank. Against it certificates are issued in lots of one thousand barrels each, at the request of the owner. It was in these that the oil exchanges dealt.

The fluctuations in the price of petroleum from 1875 to 1885 rendered a speculative investment in the article an object of exciting interest. June 1, 1879, was Sunday. The market opened on the 2nd at 74⅝ cents per barrel. It continued to fall, with little disposition to rally, until on the 17th it closed at 64⅝; and after fluctuating between 65 and 68 for four days, it reached 75, and dropped to 69⅝ on the 25th. It hovered about 70 until the 9th of August, when it began to fall, reaching 64⅝ on the 27th. A slight rally held it at about 66 until the 7th of September, when an upward movement began, reaching 96¼ on October 9th. It remained near 91 until the 10th of November, when it again moved upward, reaching $1.27½ on the 21st, closing that day at $1.22½. On the following day it ranged between $1.22½ and $1.10⅞, closing at $1.18⅛, from which it rallied, reaching on the 2nd of December $1.28⅛. Between the 10th and 18th it ranged between $1.27½ and $1.10, and fluctuated greatly between $1.18 and $1.09 from this time to January 15, 1880, when it went down in three days to $1.05, and steadily declined with scarce a rally, till, on March 9, it touched 85⅞. It hovered between 85 and 90 till April 6th, when it again commenced to decline, reaching 71¼ on the 21st. On the 5th of May it closed at 72½, and by the 26th had again reached the latitude of 93¾, closing on the 31st at 98¾. It will thus be seen that the certificates of oil in tank were worth that year from 64⅝ cents to $1.28⅛ per barrel, and this variation of almost 100 per cent. occurred between

August 27th and December 2d, an interval of only sixty-eight days.

All stock oil tanks are gauged to ascertain true dimensions, and the iron hoops are striped with white paint to guard against fraud. In days gone by a number of producers would tighten the hoops on the tank, (called driving the hoops) decreasing the capacity of the tank. This was done without reporting it to the pipe line company, and the next time the pipe line company would run the oil a shortage would be found. This led to an investigation of the pipe line authorities, and the cause of the shortage in oil was found to be due to the driving of tank hoops by a number of producers. This led to the striping with white paint across the hoops on the tank near the pipe line connections to the tank. Each tank has a register number stenciled on it in white letters. Each time the gauger received orders to run oil from the stock tanks in the oil fields he first inspected the white stripes to see if the hoops had been tightened or driven. The oil is first tested with an instrument called a "thief" to see if the oil contains any water; if it does the water is drawn off at a plug in the bottom of the tank, and the temperature is taken. The oil should be 80 degrees Fahrenheit. The measure of the oil in the tank is taken. The usual size of the tank is 250 barrels. The bottom of the tank is 16 feet and the top is 13 feet in diameter, and is 7 feet and 6 inches in height. The oil is then turned into the pipe line through a two-inch connection at the bottom of the tank by a man known in the oil country as a pipe line gauger. The oil is taken off down to the pipe line connections, which is about one foot from the bottom of the tank. The heavy matter in the bottom of the tank is "B. S.," below standard, and is left in the bottom of the tank. After the oil is run down to the connection the gauger closes the stop at the bottom of the tank and gauges the amount left in the tank; he then gives the owner a stub or run ticket for the amount of feet and inches of oil run, the pipe line company buys this oil at once, or issues a certificate for every 1,000 barrels of oil to the owner or to the persons named on the division order of the pipe line for the amount of barrels of oil in the pipe line or storage tanks to their credit, with the usual ⅛ royalty reserved for the property owner. This oil at the present time is pumped to Brooklyn, N. Y., Bayonne, N. J., Philadelphia, Pa., Baltimore, Md., Buffalo, N. Y., Cleveland, Ohio, and Whiting, Ind. (Chicago station).

The first pump stations are usually arranged to receive by gravity the oil from a number of wells. Then large force pumps are used; they raise it into great storage tanks. Regular cities of thirty-five thousand barrel iron tanks are located at Olean, New York; Meadow Lands, Tiona, Colegrove, Parker's Landing and Gregg's Station, Pennsylvania; Morgantown, Eureka, Downs Station and Sistersville, W. Va.; Lima and Cygnet, Ohio, Whiting, Ind., and other convenient points. Often as much as thirty-five million barrels of oil are stored in such tanks at one time. The trunk lines of six and eight inch wrought iron pipes takes the oil from these points, conveys it over mountains, through forests, across or under rivers, and delivers it as needed at the large cities already mentioned. On account of adverse gravity and the great friction in the pipe, many powerful pumps are needed to keep the oil moving; these are placed at central points in the valleys, and they send the oil along at a very high pressure, as high as fifteen hundred pounds to the square inch. At the terminal stations elaborate gate-houses are provided for the purpose of reducing the pressure to a point at which it is safe to deliver the oil to refineries, to discharge it into tank cars, or to pour it into the holds of tank steamers for transportation across the seas. The cargo of such a vessel may be twelve million gallons of oil in bulk, but the capacity of the pipe line is such that she can be loaded or discharged in seven hours.

The crystallizing of paraffine from the oil seriously interferes with the operation of the pipe lines. This thick and waxen coating has been known to form so rapidly that within twenty-four hours the daily flow of a six-inch pipe line has dropped off a thousand barrels. A contrivance with rotating blades called a "go-devil," driven by the force of the flow, is sent through the pipe lines to clean them.

Telegraph and telephone systems follow the route of the pipe lines, and all of the pump stations, refineries, storage points and the offices are connected by wire in case of an accident to the line that would cause a large leak, or if the line parts or breaks the pressure will drop to a low point, which will cause the pumps to run very fast, which is a warning to the engineer in charge of the pump station to stop the pumps until the line is repaired.

Following are the forms of certificates, division orders, transfer orders, purchase order, run tickets, telegraph report, working interest and royalty forms used by the several pipe lines:—

PIPE LINE CERTIFICATES.

Copy of a certificate of the National Transit Co.:—
Acceptance.

No. 10,100. OIL CITY, PA., February 10, 1896.

NATIONAL TRANSIT COMPANY, (1,000)

Through its UNITED PIPE LINES division,

Deliver to John M. Collins, McDonald, Pa.

ONE THOUSAND BARRELS of crude petroleum (of 42 gallons each) on the following terms, which are agreed to by the holder hereof:—

1. It is agreed that the petroleum mentioned in this order is held by the National Transit Company, subject to a transportation charge of twenty cents per barrel, and a storage charge which will be at the rate of twenty-five cents per day per thousand barrels, as long as the market price of certificate oil is below one dollar per barrel; thirty-five cents per day when the market price is from one dollar to one dollar and fifty cents per barrel, and forty cents per day when the market price is above one dollar and fifty cents per barrel. No change, however, to be made in rate of storage on account of prices going above or below the price named unless the market price remains above or below the specified point for thirty consecutive days, and that the account of prices going above or below the price named unless the market price remains above or below the

point of delivery of such oil shall be within the United Pipe Lines division.

Not good until accepted
By John M. Collins,
Agent at McDonald, Pa.

2. It is further agreed that this order shall be returned to the National Transit Company for exchange within six months from date of issue, or be subject to a storage charge of one-twentieth (1-20) of one cent per barrel daily thereafter until returned.

3. It is further agreed that the National Transit Company shall not, in any event, be liable for any loss of crude petroleum resulting from lightning, fire, storms or any other unavoidable causes, it being distinctly understood and agreed that any such loss or losses shall be charged *pro rata* upon all petroleum in its custody at the time of such loss or destruction, and that the quantity of petroleum called for by this order shall be reduced by its proportion of such loss or destruction.

4. It is further agreed that transportation and all accrued storage charges shall be paid on the amount so deducted.

Order No. 10,100. Accepted, February 10, 1904.

JOHN M. COLLINS, Agent. A. G. DEANE, Registrar.

McDONALD, PA., Feb. 2, 1905.

To SOUTH WEST PENNSYLVANIA PIPE LINES.

The undersigned certify and guarantee that they are the legal owners of The Knockers' and Boosters' Oil Co., Wells Nos. 1 and 2, on Riley Lewis Farm, Cecil Township, Washington County, State of Pennsylvania, including the royalty interest, and until further notice you will credit all oil as per directions below.

Credit To:—	Division of Interest.	Postoffice Address.
Jerry Berry	1/8	Soho, Pa.
Samuel Hubley	1/8	Carnegie, Pa.
John Wiles	1/8	McDonald, Pa.
Thomas Miller	1/8	McDonald, Pa.
Chas. Cameron	1/8	McDonald, Pa.
Abner Conkle	1/8	McDonald, Pa.
Frank Collins	1/8	McDonald, Pa.
Riley Lewis	owner 1/8 royalty	McDonald, Pa.

Pipe Line Tank Nos. 2,304, 2,601.

The South West Pennsylvania Pipe Lines is hereby authorized, until further notice, to receive oil from said wells for transportation for said parties severally in the proportions named, subject to the following conditions:

FIRST—Payment of a transportation charge of 20 cents per barrel; all oil received from said wells shall be delivered at the option of the South West Pennsylvania Pipe Lines at any delivery station on its lines.

SECOND—The South West Pennsylvania Pipe Lines shall charge storage at the close of each month on so much of the oil so received which shall have remained undelivered from the preceding month, at the rate of 25 cents per day per thousand barrels so long as the market price of certificate oil is below $1 per barrel; 30 cents per day when the market price is from $1 to $1.50 per barrel; and 40 cents per day when the market price is above $1.50 per barrel. No charge, however, to be made in the rate of storage on account of the price going above or below the price named, unless the market price remains above or below the specified point for thirty consecutive days.

THIRD—The South West Pennsylvania Pipe Lines shall deduct two per cent. from all oil received from wells into its custody on account of dirt and sediment, and in addition shall deduct one-twentieth of one per cent. for each degree of artificial heat above normal temperature to which said oil shall have been subjected, and oil shall be steamed as heretofore.

We agree in case of any adverse claim of title to furnish the SOUTH WEST PENNSYLVANIA PIPE LINES satisfactory evidence of title, or, failing to do so, to furnish satisfactory indemnity, upon reasonable demand, against such adverse claim or claims; and that the said the SOUTH WEST PENNSYLVANIA PIPE LINES may retain the oil until we do so, or until the dispute as to ownership is settled.

Witness:

JERRY BERRY,
SAMUEL HUBLEY,
JOHN WILES,
THOMAS MILLER,
CHAS. CAMERON,
ABNER CONKLE,

FRANK COLLINS,
Working Interest Owners.

RILEY LEWIS,
Farm and Royalty Owner.

NOTE.—The above blank should be so filled as to show distinctly whether the wells specified are owned by an individual, by tenants in common, by a co-partnership or by a corporation, and should be signed by all the owners, including the owners of royalty or their duly authorized representatives.

Butler, Pa., Feb. 1, 1905.

To NATIONAL TRANSIT COMPANY—UNITED PIPE LINES DIVISION.

The undersigned certify and guarantee that they are the legal owners of the Millerstown-Chicora Oil Company wells Nos. 1, 2 and 3, on Westerman Hoch Farm, Fairview Township, Butler County, State of Pennsylvania, including the royalty interest, and until further notice you will credit all oil as per directions below:

Credit to	Division of Interest.	Postoffice Address.
George Fredley	1/8	Chicora, Pa.
Chas. McBride	1/8	Murns, Pa.
Hugh Fredley	1/8	Saxenburg, Pa.
W. S. Eshenbaugh	1/8	West Sunbury, Pa.
H. K. Stroup	1/8	Thorn Creek, Pa.
J. D. O'Brine	1/8	Glade Run, Pa.
Peter John Cashdollar	1/8	Mars, Pa.
Westerman Hoch, farm owner	1/8 royalty	Chicora, Pa.

Pipe Line Tank Nos. 1,800, 1,940, 2,010.

The National Transit Company—United Pipe Lines Division—is hereby authorized, until further notice, to receive oil from said wells for transportation for said parties severally in the proportion named, subject to the following conditions:

FIRST—The payment of a transportation charge of 20 cents per barrel; the point of delivery for said oil shall be at the option of the National Transit Company within its UNITED PIPE LINES DIVISION.

SECOND—The National Transit Company shall charge storage at the close of each month on so much of the oil so received which shall have remained undelivered from the preceding month, at the rate of 25 cents per day per thousand barrels so long as the market price of certificate oil is below $1 per barrel; 30 cents per day when the market price is from $1 to $1.50 per barrel, and 40 cents per day when the market price is above $1.50 per barrel. No charge, however, to be made in the rate of storage on account of the price going above or below the price named, unless the market price remains above or below the specified point for thirty consecutive days.

THIRD—The National Transit Company shall deduct two per cent. from all oil received from wells into its custody on account of dirt and sediment, and in addition shall deduct one-twentieth of one per cent. for each degree of artificial heat above normal temperature to which said oil shall have been subjected, and oil shall be steamed as heretofore.

FOURTH—The National Transit Company shall not in any event be liable for loss of petroleum resulting from lightning, fire, storms, or other unavoidable causes, and such loss shall be charged pro rata upon all petroleum in its custody at the time of such loss, and transportation and all accrued storage charges shall be paid on the amounts so deducted.

We agree in case of any adverse claim of title to furnish NATIONAL TRANSIT COMPANY *satisfactory* evidence of title, or, failing to do so, to furnish satisfactory indemnity, upon reasonable demand, against such adverse claim or claims; and that the said NATIONAL TRANSIT COMPANY may retain the oil until we do so, or until the dispute as to ownership is settled.

Witness:
GEORGE FREDLEY,
CHAS. MCBRIDE,
W. S. ESHENBAUGH,
HUGH FREDLEY,
H. K. STROUP,
J. D. O'BRINE.

PETER JOHN CASHDOLLAR,
Working Interest Owners.

WESTERMAN HOCH,
Royalty Owner.

NOTE.—The above blank should be so filled as to show distinctly the wells specified are owned by an individual, by tenants in common, by a co-partnership or by a corporation; and should be signed by all owners, including the owners of royalty or their authorized representatives.

Warren, Pa., Dec. 22, 1904.

To PRODUCERS AND REFINERS OIL CO., LIMITED:

The undersigned certify and guarantee that they are the legal owners of wells No. 1, 2, 3, 4, 5, 6, 7, 8 and 9, tanks No. 40, 42, 45, 50, 60 and 64, on the Roy McWilliams Farm, Glade Township, Warren County, State of Pennsylvania, not including the royalty interest, and until further notice you will credit all oil as per direction below.

Credit.	Division of Interest.	Postoffice Address.
W. F. Ungerer	1/8	New York City, N. Y.
J. B. Brasington	1/8	Warren, Pa.
W. S. Myers	1/8	" "
Otto Dove	1/8	" "
H. J. Brasington	1/8	" "
S. P. Lytle	1/8	" "
O. B. Truby	1/8	" "
C. G. Offerly	1/8	" "

The PRODUCERS AND REFINERS OIL CO., LIMITED, is hereby authorized, until further notice, to receive the oil from the wells for said parties severally in the proportions named, subject to terms and conditions agreed upon. We agree in case of any adverse claim of title, to furnish the PRODUCERS AND REFINERS OIL CO., LIMITED, satisfactory evidence of title, or, failing to do so, to furnish satisfactory indemnity, upon reasonable demand, against said adverse claim or claims; and that the said PRODUCERS AND REFINERS OIL CO., LIMITED, may refuse to pay for the oil until we do so, or until the dispute as to ownership is settled. We further agree to promptly notify the PRODUCERS AND REFINERS OIL CO., LIMITED, of any change of ownership.

W. F. UNGERER,
J. B. BRASINGTON,
W. S. MYERS,
OTTO DOVE,
H. J. BRASINGTON,
O. B. TRUBY,

C. G. OFFERLY,
Working Interest Owners.

ROY MCWILLIAMS,
Owner one-eighth royalty.

Bradford, Pa., January 25, 1905.

To EMERY PIPE LINE:

The undersigned certify and guarantee that they are the legal owners of West Branch well No. 1, on Tarport Sawyer Farm, Bradford Township, McKean County, State of Pennsylvania, including the royalty interest, and until further notice you will credit all oil as per direction below.

Credit to	Division of Interest.	Postoffice Address.
John Duke	1/8	Duke Center, Pa.
Henry Rixford	1/8	Rixford, Pa.
William C. Custer	1/8	Custer City, Pa.
George H. Kane	1/8	Kane, Pa.
Peter J. Simpson	1/8	Simpson, Pa.
Jerry Wilcox	1/8	Wilcox, Pa.
Chas. B. Tuna	1/8	Tuna Valley, Pa.
Foster Brook, royalty owner	1/8	West Branch, Pa.

The EMERY PIPE LINE is hereby authorized, until further notice, to receive for transportation and storage oil from said well for said parties severally in the proportions named, subject to their usual terms and conditions. We agree in case of any adverse claim of title, to furnish the EMERY PIPE LINE satisfactory evidence of title, or, failing to do so, to furnish satisfactory indemnity, upon reasonable demand, against such adverse claim or claims; and that the said EMERY PIPE LINE may retain the oil until we do so, or until the dispute as to ownership is settled. We further agree to promptly notify the EMERY PIPE LINE of any change of ownership.

Witness:
JOHN DUKE,
HENRY RIXFORD,
WILLIAM C. CUSTER,
GEORGE H. KANE,
PETER J. SIMPSON,
JERRY WILCOX,

CHAS. B. TUNA,
Owners of Working Interest.

FOSTER BROOK,
Owner of One-eighth Royalty.

NOTE.—The above blank should be filled as to show distinctly whether the well specified is owned by an individual, by tenants in common, by a co-partnership or by a corporation; and should be signed by all the owners, including owners of royalty or their duly authorized representative.

TRANSFER ORDER.

Mannington, W. Va., Feb. 1, 1905.

To THE EUREKA PIPE LINE COMPANY:

We have this day sold our interest in wells Nos. 1, 2 and 3 on Flagg Meadow Farm, Rising Sun Oil Co., Burt Town District, Marion County, State of West Virginia, as below:

Interest.	Names.	P. O. Address.
¼	James Gorman	Olean, N. Y.
¼	O. B. Tulley	Painted Post, N. Y.
¼	John Tanker	Waverly, W. Va.
⅛	Peter Galaher	Claysville, Pa.
⅛	George Bailer	Sand Hill, Idaho.

You will therefore transfer the same to the credit on your books to

L. B. Gordon,
F. Harris,
G. Henderson,
N. Hartnett,
M. Homan.

Pipe Line Tank Nos. 28,000, 28,100, 28,104.

The assignee above named hereby certify and agree that they are the legal owners of the well interest above transferred and authorize the EUREKA PIPE LINE COMPANY, until further notice, to receive oil for transportation and storage pursuant to above transfer.

The Eureka Pipe Line Company is hereby authorized, until further notice, to receive oil from said wells for transportation for said parties severally in the proportions named, subject to the following conditions:

FIRST—Payment of a transportation charge of 20 cents per barrel; all oil received from said wells shall be delivered at delivery station on its lines.

SECOND—The Eureka Pipe Line Company shall charge storage against all oil run and received into its custody from wells after the expiration of the month following that in which it is received at the rate of one-fortieth of one per cent. per barrel for each day thereafter said oil shall continue to remain in its custody.

THIRD—The Eureka Pipe Line Company shall deduct two per cent. from all oil received from wells into its custody on account of dirt and sediment, and in addition shall deduct one-twentieth of one per cent. for each degree of artificial heat above normal temperature to which said oil shall have been subjected, and oil shall be steamed as heretofore.

FOURTH—The Eureka Pipe Line Company shall not in any event be liable for loss of petroleum resulting from lightning, fire, storms or other unavoidable causes, and such loss shall be charged pro rata upon all petroleum in its custody at the time of such loss, and transportation and all accrued storage charges shall be paid on the amount so deducted.

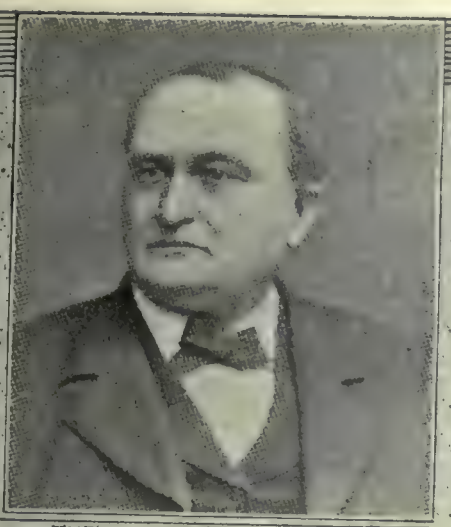
We agree in case of any adverse claim of title to furnish THE EUREKA PIPE LINE COMPANY satisfactory evidence of title, or, failing to do so, to furnish satisfactory indemnity upon reasonable demand, against such adverse claim or claims, and that the said THE EUREKA PIPE LINE COMPANY may retain the oil until the dispute as to ownership is settled.

Witness:

JAS. GORMAN,
O. B. TULLEY,
JOHN TANKER,
PETER GALAHER,
GEORGE BAILER,

L. B. GORDON,
F. HARRIS,
G. HENDERSON,
N. HARTNETT,
M. HOMAN.

NOTICE.—The above Certificate of Transfer should be so filled as to show whether the interest specified is conveyed to an individual, tenants in common, a co-partnership, or corporation; and must be signed by all the parties concerned in making the transfer, or their duly authorized agents. The subjoined agreement should be signed in like manner by all persons to whom the transfer is made, or by their duly authorized agents.



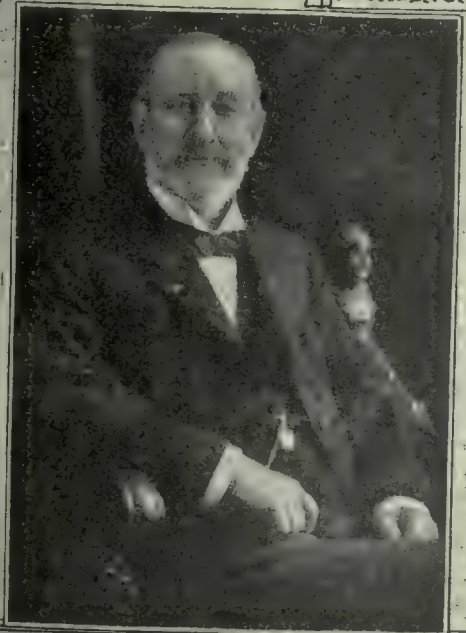
THE LATE BYRON D. BENSON
EXPRESIDENT OF THE TIDE WATER PIPE LINE



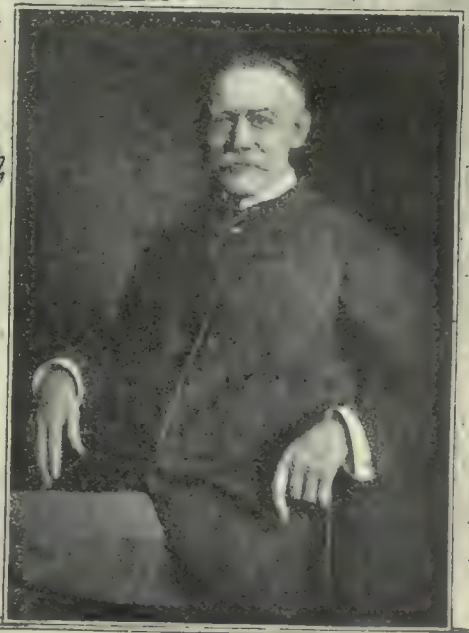
DAVID K. McKELVY
EX-PRESIDENT OF THE TIDE WATER PIPE LINE



THE LATE DAVID HOSTETTER
FOUNDER OF THE COLUMBIA CONDUIT PIPE LINE



THE LATE MAJOR ROBERT E. HOPKINS.
EX-TREASURER OF THE TIDE WATER PIPE LINE



SAMUEL Q. BROWN.
PRESIDENT OF THE TIDE WATER PIPE LINE.

IRON AND WOODEN OIL TANKS

DEDUCTIONS, WOOD STAVES.

THICKNESS INCHES.	DEDUCT FROM OUTSIDE CIR.
1	0.52
1/16	0.56
1/8	0.59
3/16	0.62
1/4	0.65
5/16	0.69
3/8	0.72
7/16	0.75
1/2	0.78
9/16	0.82
5/8	0.85
11/16	0.88
3/4	0.91
13/16	0.95
7/8	0.98
15/16	1.01
2	1.04
1/16	1.08
1/8	1.11
3/16	1.15
1/4	1.18
5/16	1.21
3/8	1.24
7/16	1.27
1/2	131
9/16	1.34
5/8	1.37
13/16	141
7/8	144
15/16	147

DEDUCTIONS FOR IRON TANKS.

GAUGE OF IRON	THICKNESS, IN INCHES.	DEDUCT FROM OUTSIDE MEASUREMENT.
8	3/32	.087
7	3/16	.094
6	13/64	.106
5	7/32	.116
4	1/4	.124
3	9/32	.135
2	5/16	.147
1	11/32	.157
0	3/8	.179
00	25/64	.138
000	13/32	.222

RULE FOR DETERMINING THE CONTENTS OF WOODEN TANKS

SUCH AS ARE USED AT OIL WELLS.

At the point where the tank is measured, square the circumference, then multiply by 07958 which equals area at point in tank where measured; multiply by 144, which equals the number of square inches. Divide by 231 (number of cubic inches in a gallon) then divide by 42 (number of gallons in a barrel). Result is the number of barrels per inch

It is customary to measure the outer circumference of a tank, taking such measurements each 2 feet between top and bottom, commencing at a point representing the actual inside bottom (as staves on outside project below bottom) The intermediate measurements are calculated by proportion thus: . If the first measurement is 42 feet, and the next 2 feet is 40 feet, the measurement midway between, or 1 foot above the bottom, will be 41 feet.

EXAMPLE.

32 feet = circumference of a 100-bbl. tank on the bottom line
32 feet squared = 1024
Multiply by .07958 = 81.48992
Multiply by 144 = 11734.54848 square inches
Divide by 231 = 50.79891 gallons
Divide by 42 = 1.209+ no. bbls. per inch in bottom of tank

Formula for computing tanks—bbls. per inch—

$$\frac{\text{Circum}^2 \times 0.07958 \times 144}{231 \times 42}$$

NOTE:

Measurements must be taken in feet and decimal parts. *Deductions* from outside measurements must be made to allow for thickness of staves See table showing *percentage* to be deducted from circumference before computing contents.

Deductions must be made for roof supports or other deadwood in tanks. Calculate the areas of such deadwood in inches, divide by 9702, which will equal the barrels per inch to be deducted

DIMENSIONS AND WEIGHTS.

WOODEN TANKS.

Diameter, feet	Length of staves, feet	No. of hoops	Capacity, gallons	Shipping weight, lbs.	Diameter, feet	Length of staves, feet	No. of hoops	Capacity, gallons	Shipping weight, lbs.
3	3	3	158	**220**	12	12	12	9,658	**3,091**
4	4	4	321	**361**	13	6	6	5.378	**2,138**
5	4	4	587	**505**	13	8	8	7.363	**2,556**
6	4	4	720	**586**	13	12	12	11,333	**3,481**
6	6	5	1145	**776**	14	8	8	8.540	**2,765**
7	4	4	983	**694**	14	12	12	13,146	**3,796**
7	6	5	1559	**921**	14	14	13	15,449	**4,280**
8	4	4	1294	**840**	15	6	5	7,160	**2,530**
8	6	5	2031	**1096**	15	8	8	9.804	**3,093**
8	8	7	2781	**1372**	15	12	12	15.090	**4,130**
9	4	4	1623	**971**	15	16	15	19,070	**4,943**
9	6	5	2577	**1260**	16	6	5	8,147	**2,686**
9	8	8	3529	**1553**	16	8	8	11,155	**3,370**
10	4	4	2006	**1124**	16	12	12	17,170	**4,529**
10	6	5	3182	**1454**	16	14	13	20.179	**4,080**
10	8	8	4357	**1784**	16	16	16	23.187	**5,678**
11	4	4	2428	**1307**	18	8	8	14.118	**4,091**
11	6	5	3850	**1679**	18	12	12	21,730	**5,870**
11	8	8	5272	**2079**	18	16	16	29,184	**6,750**
12	4	4	2891	**1414**	20	14	14	31,334	**6,850**
12	6	5	4582	**1843**	20	16	16	36.035	**7,784**
12	8	8	6274	**2250**	24	16	16	51,889	**10,400**
11	11	10	7405	**2632**					

CONTENTS OF TANKS—BARRELS PER INCH.

CIR FEET	.00	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	CIR FEET
14	.231	.233	.234	.236	.238	.240	.241	.243	.245	.247	.249	.250	.252	.254	.255	.257	.259	.260	.262	.264	14
15	.265	.267	.269	.270	.272	.274	.276	.278	.280	.281	.283	.285	.287	.289	.291	.293	.295	.297	.299	.300	15
16	.302	.304	.306	.308	.310	.311	.313	.315	.317	.319	.321	.323	.325	.327	.329	.331	.333	.335	.337	.339	16
17	.341	.343	.345	.347	.349	.351	.353	.356	.358	.360	.362	.364	.366	.368	.370	.372	.374	.376	.378	.380	17
18	.383	.385	.387	.388	.390	.392	.394	.396	.398	.400	.403	.405	.407	.410	.412	.415	.418	.420	.422	.424	18
19	.426	.428	.430	.432	.434	.437	.439	.441	.443	.445	.448	.450	.453	.455	.458	.460	.463	.466	.468	.470	19
20	.472	.475	.477	.480	.482	.485	.487	.489	.491	.493	.495	.498	.500	.503	.505	.508	.510	.513	.515	.518	20
21	.521	.523	.525	.528	.530	.533	.535	.538	.540	.542	.545	.548	.550	.553	.556	.559	.561	.564	.566	.569	21
22	.571	.573	.576	.579	.582	.585	.587	.590	.592	.595	.598	.601	.603	.606	.608	.611	.613	.616	.619	.622	22
23	.625	.627	.630	.632	.635	.638	.641	.644	.647	.650	.653	.655	.658	.660	.663	.666	.668	.671	.674	.677	23
24	.680	.683	.686	.688	.691	.694	.697	.700	.703	.706	.709	.712	.715	.718	.721	.724	.726	.729	.732	.735	24
25	.738	.741	.744	.747	.750	.753	.756	.759	.762	.765	.768	.771	.774	.777	.780	.783	.786	.789	.792	.795	25
26	.798	.801	.804	.807	.810	.814	.817	.821	.824	.827	.830	.833	.836	.839	.842	.845	.848	.852	.855	.858	26
27	.861	.864	.867	.870	.874	.877	.880	.884	.887	.890	.893	.896	.900	.903	.906	.909	.912	.916	.920	.923	27
28	.926	.930	.933	.936	.939	.942	.945	.949	.952	.956	.959	.963	.966	.970	.973	.976	.980	.983	.987	.990	28
29	.993	.997	1.000	1.004	1.007	1.010	1.014	1.017	1.021	1.024	1.028	1.031	1.035	1.039	1.042	1.045	1.049	1.052	1.056	1.060	29
30	1.063	1.066	1.070	1.074	1.077	1.080	1.084	1.087	1.091	1.095	1.099	1.102	1.106	1.110	1.113	1.117	1.121	1.124	1.128	1.131	30
31	1.135	1.139	1.142	1.146	1.150	1.154	1.157	1.161	1.165	1.168	1.172	1.175	1.179	1.183	1.187	1.191	1.195	1.198	1.202	1.206	31
32	1.209	1.213	1.217	1.220	1.224	1.228	1.232	1.236	1.240	1.244	1.248	1.251	1.255	1.258	1.263	1.267	1.271	1.275	1.278	1.282	32
33	1.286	1.290	1.294	1.298	1.302	1.306	1.309	1.313	1.317	1.321	1.325	1.329	1.333	1.337	1.341	1.345	1.349	1.353	1.357	1.361	33
34	1.365	1.369	1.373	1.378	1.382	1.385	1.389	1.393	1.397	1.401	1.405	1.409	1.413	1.418	1.423	1.426	1.430	1.434	1.438	1.442	34
35	1.446	1.450	1.454	1.459	1.463	1.467	1.471	1.475	1.479	1.484	1.488	1.493	1.497	1.501	1.505	1.509	1.513	1.518	1.522	1.527	35
36	1.531	1.535	1.539	1.543	1.547	1.552	1.556	1.560	1.564	1.569	1.573	1.577	1.582	1.586	1.591	1.595	1.600	1.604	1.609	1.613	36
37	1.617	1.622	1.626	1.630	1.634	1.638	1.643	1.647	1.652	1.657	1.661	1.666	1.671	1.675	1.679	1.684	1.689	1.693	1.697	1.701	37
38	1.705	1.710	1.715	1.719	1.724	1.728	1.733	1.737	1.742	1.747	1.751	1.756	1.760	1.765	1.769	1.774	1.779	1.783	1.787	1.792	38
39	1.796	1.800	1.805	1.810	1.815	1.820	1.825	1.829	1.834	1.839	1.843	1.848	1.852	1.857	1.861	1.866	1.870	1.875	1.880	1.885	39
40	1.890	1.894	1.899	1.903	1.908	1.914	1.918	1.923	1.928	1.933	1.937	1.942	1.946	1.951	1.956	1.961	1.966	1.971	1.976	1.981	40
41	1.986	1.990	1.995	1.999	2.004	2.009	2.014	2.019	2.024	2.029	2.034	2.039	2.044	2.049	2.054	2.059	2.064	2.069	2.074	2.079	41
42	2.084	2.088	2.093	2.098	2.103	2.108	2.112	2.117	2.122	2.127	2.133	2.138	2.144	2.149	2.154	2.159	2.164	2.169	2.174	2.179	42
43	2.184	2.189	2.194	2.199	2.204	2.209	2.214	2.219	2.224	2.229	2.235	2.240	2.245	2.251	2.256	2.261	2.266	2.271	2.276	2.282	43
44	2.287	2.292	2.297	2.302	2.308	2.313	2.318	2.323	2.328	2.333	2.338	2.343	2.349	2.354	2.460	2.365	2.370	2.376	2.381	2.386	44
45	2.392	2.397	2.403	2.408	2.413	2.419	2.424	2.429	2.434	2.440	2.445	2.451	2.456	2.461	2.466	2.472	2.477	2.483	2.488	2.494	45
46	2.499	2.505	2.510	2.516	2.521	2.527	2.532	2.538	2.543	2.548	2.554	2.560	2.565	2.571	2.576	2.581	2.587	2.592	2.598	2.604	46
47	2.609	2.615	2.620	2.626	2.631	2.637	2.643	2.648	2.654	2.659	2.665	2.671	2.676	2.682	2.687	2.693	2.699	2.705	2.711	2.717	47
48	2.722	2.728	2.733	2.739	2.744	2.750	2.756	2.761	2.767	2.772	2.778	2.783	2.789	2.795	2.801	2.807	2.813	2.819	2.824	2.830	48
49	2.836	2.842	2.848	2.854	2.859	2.865	2.871	2.876	2.882	2.888	2.894	2.899	2.904	2.910	2.917	2.923	2.929	2.935	2.941	2.947	49
50	2.953	2.959	2.965	2.971	2.977	2.983	2.988	2.994	3.000	3.006	3.012	3.018	3.024	3.030	3.036	3.042	3.048	3.054	3.060	3.067	50
51	3.073	3.079	3.084	3.090	3.096	3.102	3.108	3.114	3.120	3.127	3.133	3.139	3.145	3.152	3.158	3.164	3.170	3.176	3.182	3.188	51
52	3.194	3.200	3.206	3.212	3.218	3.225	3.231	3.237	3.243	3.250	3.256	3.262	3.269	3.275	3.281	3.287	3.294	3.300	3.306	3.312	52
53	3.318	3.324	3.331	3.337	3.343	3.349	3.355	3.362	3.368	3.375	3.381	3.387	3.394	3.400	3.407	3.413	3.419	3.425	3.432	3.438	53
54	3.444	3.450	3.457	3.463	3.469	3.476	3.482	3.489	3.495	3.501	3.508	3.515	3.521	3.528	3.534	3.541	3.548	3.554	3.560	3.566	54
55	3.572	3.579	3.586	3.593	3.599	3.605	3.611	3.618	3.625	3.631	3.638	3.645	3.651	3.658	3.664	3.671	3.678	3.684	3.691	3.698	55
56	3.704	3.710	3.717	3.724	3.731	3.737	3.743	3.750	3.757	3.764	3.771	3.777	3.783	3.790	3.797	3.803	3.810	3.817	3.824	3.831	56
57	3.837	3.843	3.850	3.857	3.864	3.871	3.878	3.885	3.892	3.894	3.906	3.913	3.919	3.925	3.932	3.939	3.945	3.952	3.959	3.966	57
58	3.973	3.980	3.987	3.994	4.001	4.008	4.015	4.022	4.029	4.036	4.043	4.050	4.057	4.064	4.070	4.077	4.084	4.091	4.098	4.105	58
59	4.111	4.118	4.125	4.132	4.139	4.147	4.154	4.161	4.168	4.175	4.182	4.189	4.196	4.203	4.210	4.217	4.224	4.231	4.238	4.245	59
60	4.252	4.259	4.266	4.273	4.280	4.288	4.295	4.303	4.309	4.316	4.323	4.330	4.338	4.345	4.352	4.359	4.366	4.372	4.380	4.387	60
61	4.395	4.402	4.409	4.416	4.423	4.430	4.437	4.445	4.452	4.460	4.467	4.475	4.482	4.489	4.496	4.503	4.510	4.517	4.525	4.532	61
62	4.541	4.548	4.555	4.562	4.569	4.577	4.584	4.591	4.598	4.606	4.614	4.621	4.629	4.636	4.643	4.651	4.658	4.666	4.673	4.680	62
63	4.688	4.696	4.703	4.710	4.717	4.725	4.733	4.740	4.748	4.755	4.762	4.770	4.777	4.785	4.792	4.800	4.807	4.815	4.823	4.830	63
64	4.837	4.845	4.853	4.861	4.869	4.876	4.885	4.892	4.899	4.907	4.914	4.922	4.929	4.937	4.944	4.952	4.960	4.967	4.975	4.982	64
65	4.990	4.997	5.005	5.013	5.021	5.029	5.037	5.044	5.052	5.060	5.067	5.075	5.083	5.090	5.098	5.106	5.114	5.121	5.129	5.137	65
66	5.145	5.152	5.160	5.168	5.176	5.184	5.191	5.199	5.207	5.215	5.223	5.231	5.238	5.246	5.254	5.262	5.270	5.278	5.286	5.294	66
67	5.302	5.310	5.318	5.326	5.334	5.342	5.350	5.358	5.366	5.374	5.382	5.389	5.397	5.405	5.413	5.421	5.429	5.437	5.445	5.453	67
68	5.461	5.469	5.477	5.485	5.494	5.502	5.511	5.519	5.527	5.535	5.543	5.551	5.559	5.567	5.575	5.583	5.591	5.599	5.607	5.615	68
69	5.623	5.631	5.639	5.647	5.656	5.664	5.673	5.681	5.690	5.698	5.706	5.714	5.723	5.731	5.739	5.747	5.755	5.763	5.771	5.779	69
70	5.788	5.796	5.804	5.812	5.820	5.829	5.837	5.846	5.854	5.863	5.871	5.879	5.888	5.896	5.905	5.913	5.921	5.929	5.938	5.946	70
71	5.954	5.963	5.971	5.979	5.988	5.996	6.005	6.013	6.021	6.030	6.039	6.047	6.056	6.064	6.073	6.081	6.089	6.098	6.106	6.115	71
72	6.123	6.132	6.140	6.149	6.158	6.166	6.175	6.183	6.191	6.200	6.209	6.217	6.226	6.234	6.243	6.251	6.260	6.268	6.277	6.285	72
73	6.294	6.303	6.311	6.320	6.329	6.338	6.347	6.355	6.363	6.372	6.381	6.389	6.398	6.406	6.415	6.424	6.432	6.441	6.450	6.459	73
74	6.468	6.476	6.485	6.494	6.503	6.512	6.521	6.529	6.538	6.547	6.556	6.564	6.573	6.581	6.590	6.599	6.608	6.617	6.626	6.635	74
75	6.644	6.652	6.660	6.669	6.678	6.688	6.697	6.706	6.715	6.724	6.733	6.741	6.750	6.759	6.768	6.777	6.786	6.795	6.804	6.813	75
76	6.822	6.831	6.840	6.849	6.858	6.867	6.876	6.885	6.894	6.903	6.913	6.922	6.930	6.939	6.948	6.957	6.966	6.975	6.984	6.993	76
77	7.002	7.012	7.021	7.031	7.040	7.049	7.058	7.067	7.076	7.085	7.095	7.104	7.113	7.122	7.131	7.140	7.149	7.158	7.167	7.176	77
78	7.186	7.195	7.204	7.214	7.224	7.233	7.242	7.251	7.261	7.270	7.279	7.288	7.297	7.307	7.316	7.325	7.334	7.343	7.353	7.362	78
79	7.372	7.381	7.389	7.399	7.408	7.418	7.428	7.437	7.447	7.456	7.465	7.475	7.484	7.494	7.503	7.512	7.523	7.531	7.540	7.550	79
80	7.559	7.568	7.578	7.587	7.596	7.606	7.615	7.625	7.634	7.644	7.654	7.663	7.673	7.683	7.692	7.702	7.711	7.721	7.730	7.740	80
81	7.750	7.759	7.768	7.777	7.787	7.796	7.806	7.816	7.826	7.836	7.846	7.855	7.864	7.870	7.884	7.894	7.904	7.913	7.922	7.932	81
82	7.942	7.952	7.961	7.971	7.980	7.990	7.999	8.009	8.019	8.029	8.039	8.049	8.059	8.069	8.078	8.088	8.098	8.108	8.117	8.127	82
83	8.137	8.147	8.156	8.166	8.176	8.186	8.196	8.206	8.216	8.226	8.236	8.246	8.256	8.266	8.275	8.285	8.295	8.305	8.315	8.325	83
84	8.334	8.344	8.354	8.364	8.374	8.384	8.394	8.404	8.414	8.424	8.434	8.444	8.454	8.464	8.474	8.484	8.494	8.504	8.514	8.524	84
85	8.534	8.544	8.554	8.564	8.574	8.584	8.594	8.604	8.614	8.624	8.635	8.645	8.655	8.665	8.675	8.685	8.695	8.705	8.715	8.725	85
86	8.736	8.746	8.756	8.766	8.776	8.786	8.796	8.806	8.817	8.827	8.837	8.848	8.858	8.868	8.879	8.889	8.899	8.909	8.919	8.929	86
87	8.940	8.950	8.960	8.970	8.981	8.991	9.001	9.011	9.021	9.032	9.043	9.053	9.064	9.074	9.085	9.095	9.105	9.116	9.126	9.137	87
88	9.147	9.157	9.167	9.178	9.188	9.199	9.209	9.220	9.230	9.241	9.251	9.261	9.272	9.282	9.293	9.304	9.314	9.325	9.335	9.346	88
89	9.356	9.367	9.377	9.388	9.398	9.409	9.419	9.430	9.441	9.451	9.461	9.471	9.483	9.493	9.504	9.514	9.525	9.536	9.546	9.557	89
90	9.568	9.579	9.589	9.600	9.610	9.621	9.631	9.642	9.653	9.663	9.674	9.684	9.695	9.706	9.717	9.728	9.738	9.749	9.759	9.770	90
91	9.781	9.792	9.802	9.813	9.824	9.835	9.846	9.856	9.867	9.878	9.889	9.899	9.910	9.921	9.932	9.943	9.953	9.964	9.975	9.986	91
92	9.997	10.008	10.018	10.029	10.040	10.051	10.062	10.073	10.084	10.095	10.106	10.117	10.128	10.139	10.150	10.161	10.172	10.183	10.194	10.205	92
93	10.216	10.227	10.238	10.249	10.260	10.271	10.282	10.293	10.304	10.315	10.326	10.337	10.348	10.359	10.370	10.381	10.392	10.404	10.415	10.426	93
94	10.437	10.449	10.460	10.471	10.482	10.493	10.504	10.515	10.526	10.537	10.548	10.560	10.571	10.582	10.593	10.604	10.616	10.627	10.638	10.649	94
95	10.660	10.672	10.683	10.694	10.705	10.716	10.728	10.739	10.750	10.762	10.773	10.784	10.795	10.806	10.817	10.829	10.840	10.852	10.863	10.874	95
96	10.885	10.896	10.908	10.919	10.930	10.942	10.954	10.965	10.977	10.988	10.999	11.011	11.022	11.034	11.045	11.056	11.068	11.079	11.090	11.102	96
97	11.113	11.124	11.136	11.147	11.159	11.171	11.182	11.194	11.205	11.217	11.228	11.240	11.251	11.263	11.274	11.286	11.297	11.309	11.320	11.332	97
98	11.344	11.355	11.367	11.378	11.390	11.402	11.413	11.425	11.436	11.448	11.460	11.471	11.483	11.494	11.506	11.518	11.529	11.541	11.552	11.564	98
99	11.576	11.587	11.599	11.611	11.623	11.635	11.647	11.658	11.670	11.682	11.694	11.706	11.717	11.729	11.740	11.752	11.763	11.775	11.787	11.799	99

FOR TANKS MORE THAN 100 FT CIRCUMFERENCE, DIVIDE THE CIR BY 2, AND TAKE OUT OF TABLE THE AMOUNT OPPOSITE THE QUOTIENT, MULTIPLY THIS AMOUNT BY 4 FOR BBLS PER INCH

Oil-country standard measurement, 42 gallons equal 1 barrel.

CIRCULAR CAR TANKS — GALLONS IN ONE FOOT OF LENGTH.

CIR. FEET.	.00	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	CIR. FEET.
9	48.22	48.75	49.30	49.84	50.38	50.94	51.48	52.04	52.60	53.17	53.73	54.29	54.87	55.44	56.02	56.59	57.17	57.76	58.34	58.94	9
10	59.53	60.13	60.73	61.33	61.94	62.54	63.15	63.77	64.39	65.01	65.63	66.26	66.89	67.52	68.16	68.80	69.44	70.08	70.73	71.38	10
11	72.03	72.69	73.35	74.01	74.67	75.34	76.01	76.69	77.36	78.04	78.73	79.41	80.10	80.79	81.49	82.19	82.89	83.59	84.30	85.01	11
12	85.72	86.44	87.16	87.88	88.61	89.33	90.06	90.80	91.54	92.27	93.02	93.76	94.51	95.26	96.01	96.77	97.53	98.30	99.06	99.83	12
13	100.61	101.38	102.16	102.94	103.72	104.51	105.30	106.10	106.89	107.68	108.49	109.30	110.11	110.92	111.73	112.55	113.37	114.19	115.02	115.85	13
14	116.68	117.51	118.35	119.19	120.04	120.88	121.73	122.59	123.44	124.30	125.16	126.03	126.89	127.76	128.64	129.52	130.40	131.28	132.16	133.05	14
15	133.94	134.84	135.74	136.64	137.54	138.44	139.35	140.27	141.18	142.10	143.02	143.94	144.87	145.80	146.73	147.67	148.61	149.55	150.50	151.45	15
16	152.40	153.35	154.31	155.27	156.23	157.20	158.16	159.14	160.11	161.09	162.07	163.05	164.04	165.03	166.02	167.02	168.02	169.02	170.02	171.03	16
17	172.04	173.06	174.07	175.09	176.11	177.14	178.17	179.20	180.23	181.27	182.31	183.35	184.40	185.45	186.50	187.56	188.61	189.67	190.74	191.81	17
18	192.88	193.95	195.03	196.11	197.19	198.27	199.36	200.45	201.54	202.64	203.74	204.84	205.95	207.09	208.17	209.29	210.40	211.52	212.65	213.77	18
19	214.90	216.04	217.17	218.31	219.45	220.60	221.75	222.90	224.09	225.20	226.36	227.53	228.69	229.86	231.03	232.20	233.38	234.56	235.75	236.93	19
20	238.12	239.31	240.51	241.70	242.91	244.11	245.32	246.53	247.74	248.96	250.17	251.40	252.62	253.85	255.08	256.31	257.55	258.79	260.03	261.28	20

Oil-country standard measurement, 42 gallons equal 1 barrel.

UNION PIPE LINE CO

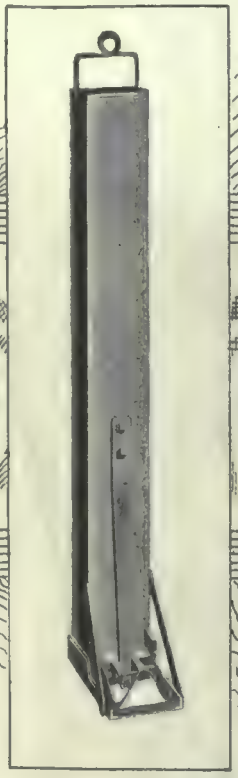


OIL RACK LOADING AN OIL TRAIN

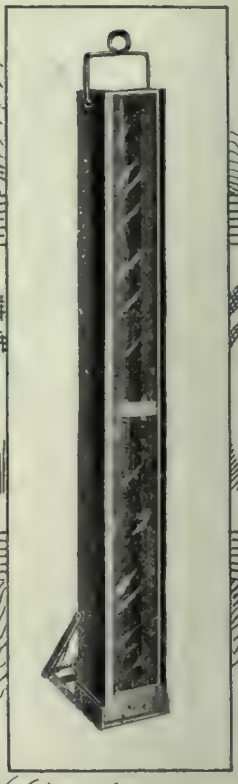




CITY OF 35.000 BBL. OIL TANKS, OLEAN, N.Y.







PIPE LINE OIL GAUGER, AMERICAN OIL FIELDS

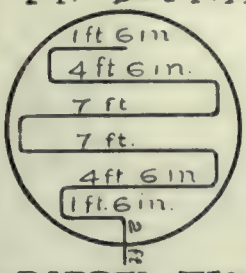


ELBA OIL PUMP STATION, ELBA OHIO.

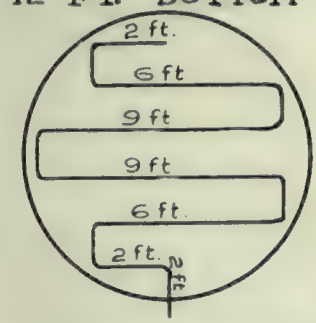


TWO OF STANDARD OIL CO'S EXPORT OIL STEAMERS.

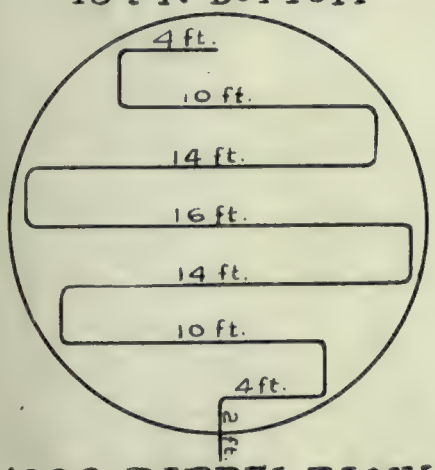
100 BARREL TANK
10 FT. BOTTOM



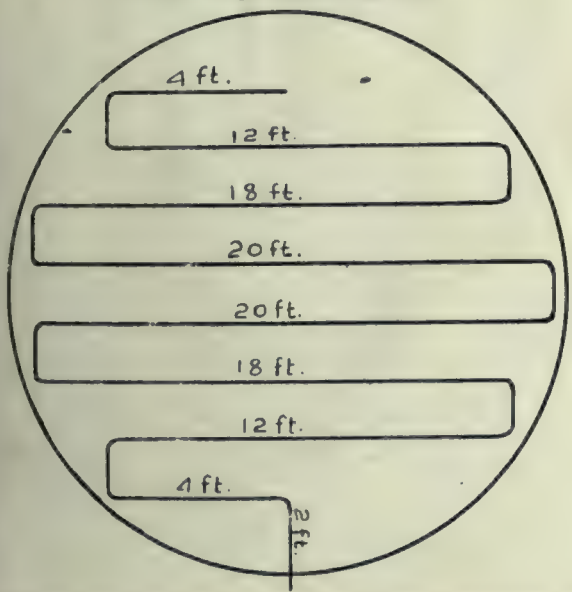
150 BARREL TANK
12 FT. BOTTOM



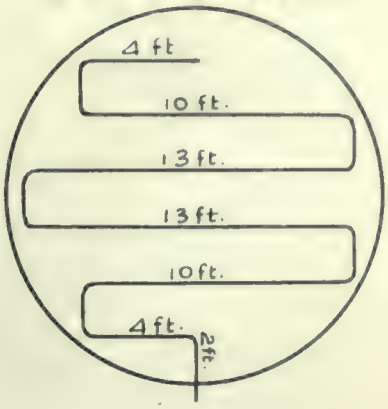
500 BARREL TANK
18 FT. BOTTOM



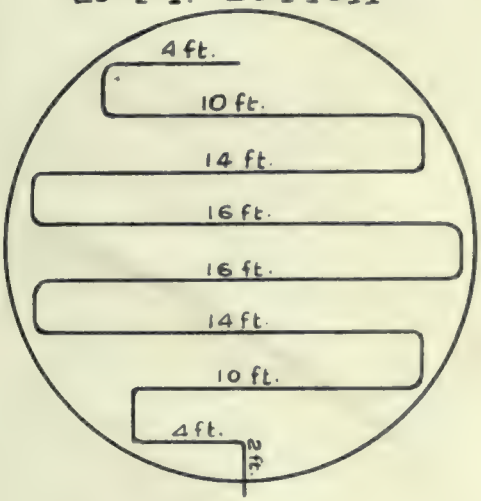
1200 BARREL TANK
24 FT. BOTTOM



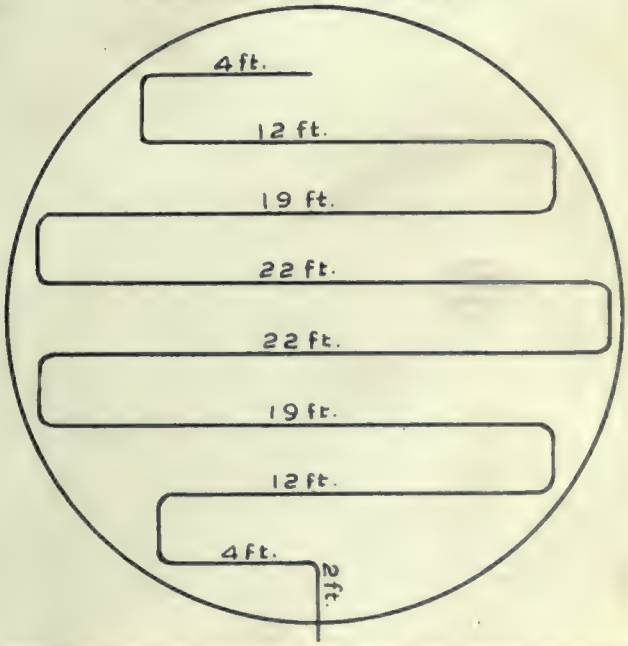
250 BARREL TANK
16 FT. BOTTOM



800 BARREL TANK
20 FT. BOTTOM



1400 BARREL TANK
26 FT. BOTTOM





GREGGS OIL PUMP STATION

(McDonald-Oakdale, Pa., Oil Field) Greggs Station, Pa.



SOUTHERN PIPE LINE

(Standard Oil Company's Seaboard Oil Pump Station) Morgantown, West Va.



J. L. GRANDIN
TIDIOUTE AND WARREN PIPE LINE



E. B. GRANDIN
TIDIOUTE AND WARREN PIPE LINE



ADNAH NEYHART
TIDIOUTE AND WARREN PIPE LINE



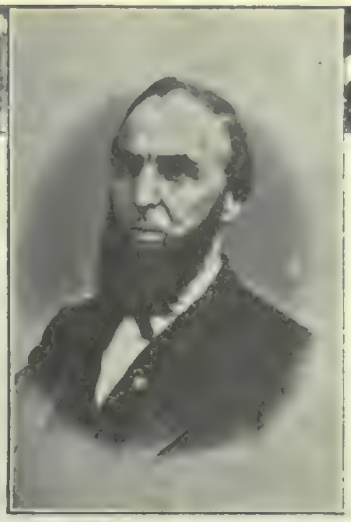
DR. F. B. BREWER,
OF THE FIRM OF BREWER, WATSON & CO.



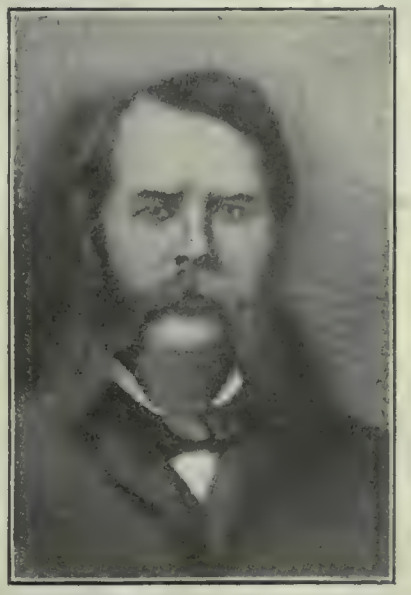
JONATHAN WATSON
OF THE FIRM OF BREWER, WATSON & CO.



CHARLES LOCKHART
THE OLDEST LIVING OIL PRODUCER



ORANGE NOBLE
OF THE NOBLE-DELAMATER WELL



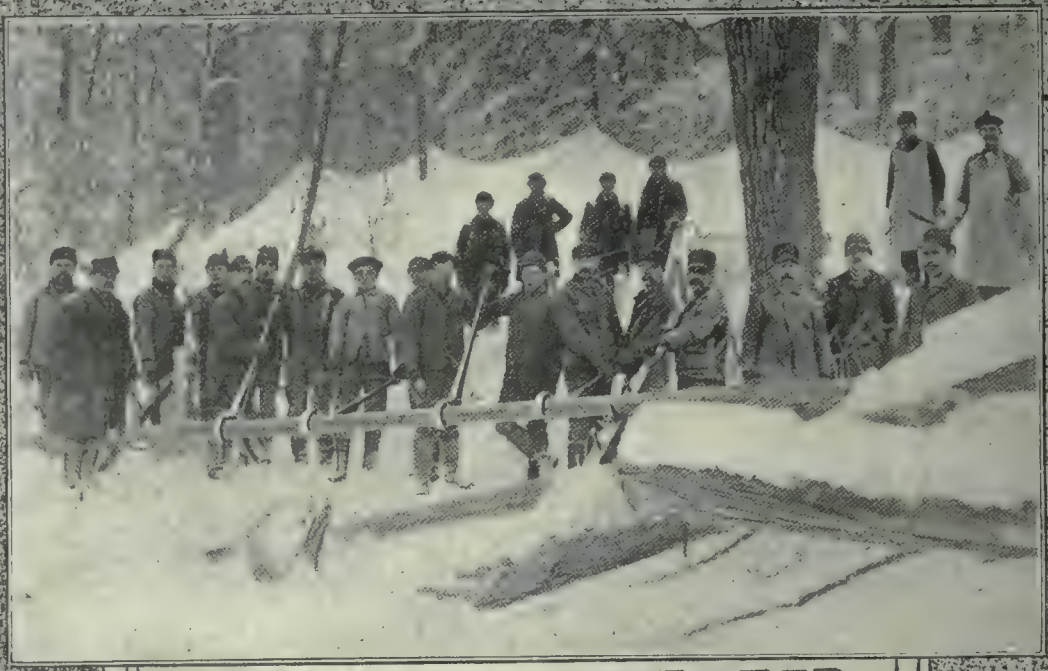
W. G. WARDEN
SECRETARY OF THE SOUTH IMPROVEMENT CO.



JAMES S. TARR
OWNER OF THE TARR FARM



WILLIAM BARNSDALL
ONE OF FIRST PRODUCERS ON OIL CREEK



LAYING PIPE LINE NEAR
OIL CITY, PENNA.



OIL PUMP STATION ON
SEABOARD PIPE LINE.



AN OIL TANK CAR.



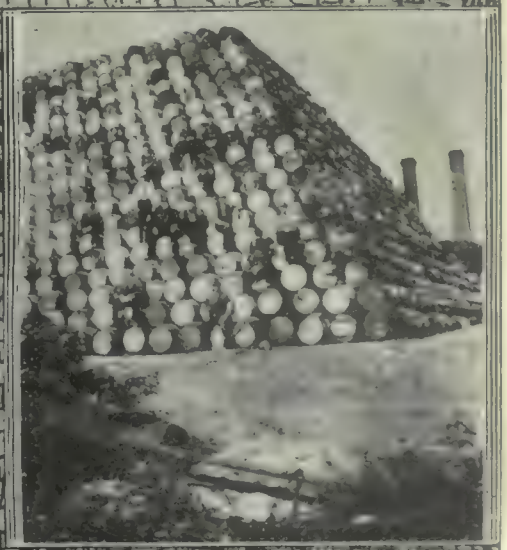
WAGON FOR RETAILING REFINED OIL



EMERY MANUFACTURING CO OIL REFINERY BRADFORD PA.



PIPE LINE GO-DEVILS.



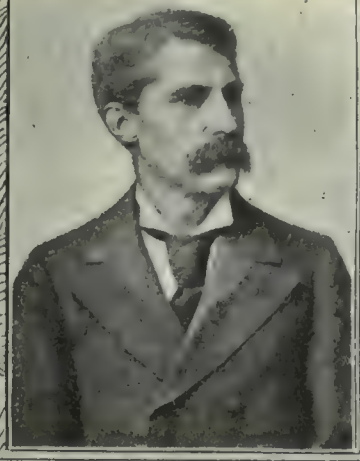
A PILE OF 15 000 OIL BBLS. FRANKLIN PA



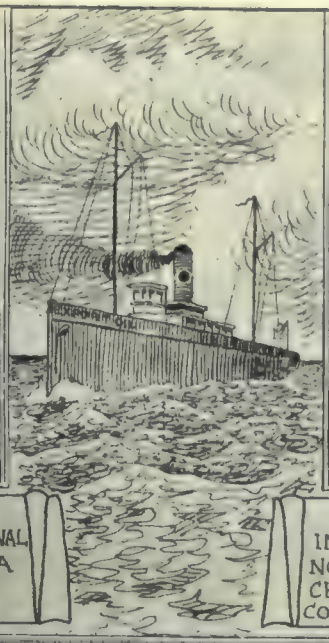
EMERY MANUFACTURING CO.,
OIL REFINERS BRADFORD, PA.



PHILADELPHIA OIL REFINERY,
PHILADELPHIA PA.



HENRY M. FLAGLER, IN 1872
ONE OF THE FOUNDERS OF THE ORIGINAL STANDARD OIL COMPANY AND A STOCKHOLDER IN THE SOUTH IMPROVEMENT COMPANY





JOHN. D ARCHBOLD, IN 1872
INDEPENDENT OIL REFINER. NOW VICE PRESIDENT AND THE CHAIRMAN OF THE EXECUTIVE COMMITTEE OF THE STANDARD OIL CO.



JOHN. D ROCKEFELLER
OIL REFINER IN 1872, FOUNDER AND PRESIDENT OF THE STANDARD OIL COMPANY

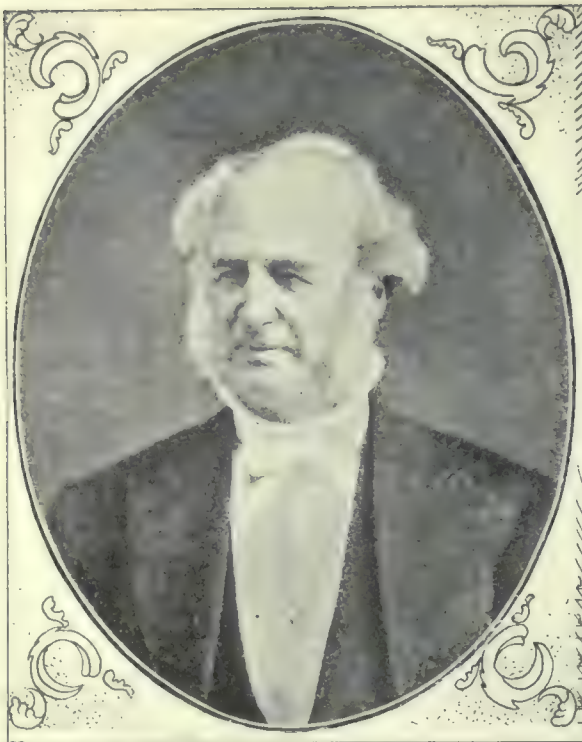


HENRY. H. ROGERS IN 1872
INDEPENDENT OIL REFINER. NOW PRESIDENT OF THE NATIONAL TRANSIT PIPE LINES AND A DIRECTOR OF THE STANDARD OIL CO.

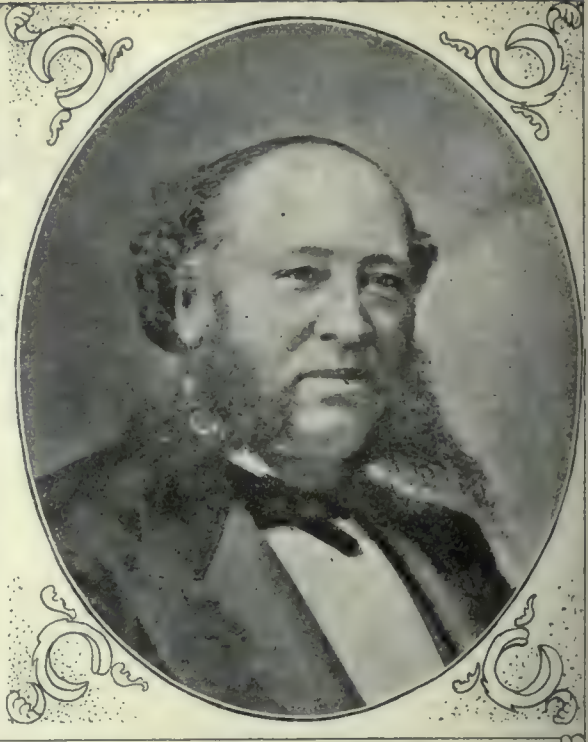




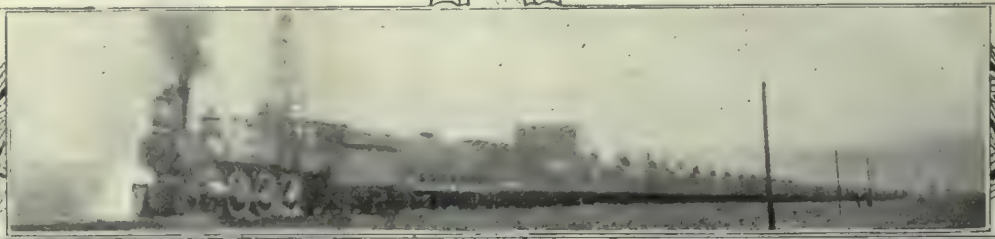
DANIEL. O DAY
OIL INSPECTOR AND CAR TRACER IN 1872, NOW VICE PRESIDENT OF THE NATIONAL TRANSIT CO. ONE OF THE CONSTITUENT COS OF THE STANDARD.



CORNELIUS VANDERBILT
PRESIDENT OF THE NEW YORK CENTRAL RAILROAD IN 1872 AND OCCUPIED THAT POSITION AT THE TIME OF THE SOUTH IMPROVEMENT CO.

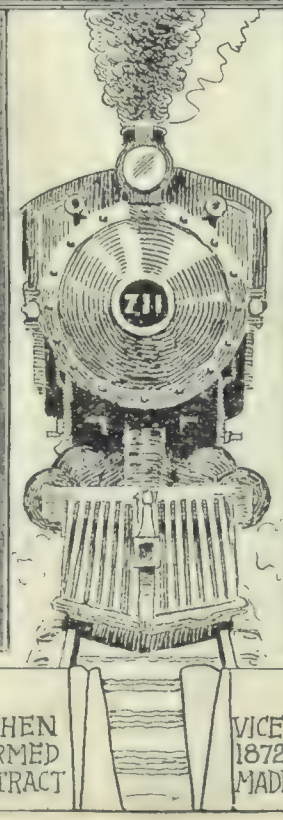


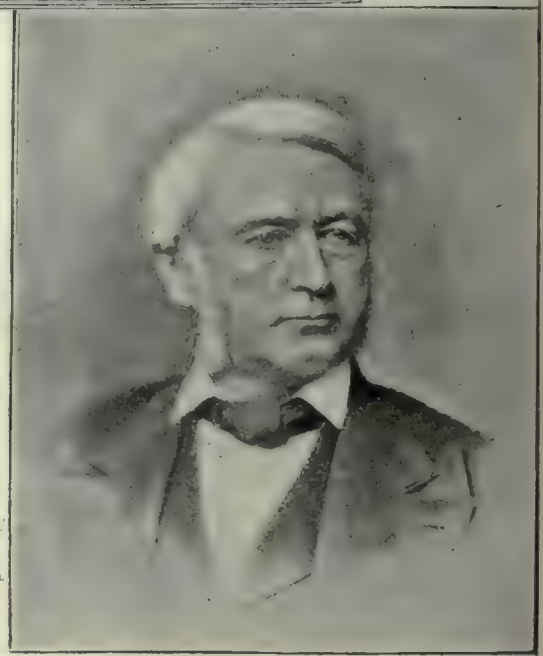
WILLIAM H. VANDERBILT
THE CONTRACT OF THE SOUTH IMPROVEMENT CO. WITH THE NEW YORK CENTRAL R.R. WAS SIGNED BY WM. H VANDERBILT, VICE PRESIDENT OF THE ROAD





JAY GOULD
PRESIDENT OF THE ERIE RAILROAD WHEN THE SOUTH IMPROVEMENT CO WAS FORMED AND IT WAS HE WHO SIGNED THE CONTRACT





THOMAS A. SCOTT
VICE PRESIDENT OF THE PENNSYLVANIA RAILROAD IN 1872. THROUGH HIM THE SOUTH IMPROVEMENT CO. MADE AN AGREEMENT WITH THE PENNSYLVANIA R.R.

PURCHASE ORDER.

Bradford Office, Bradford, Pa., Jan. 18, 1905.

Charges, none.

NATIONAL TRANSIT COMPANY—UNITED PIPE LINES DIVISION.

Transfer to credit of P. S. TRAINOR One Thousand and Five Hundred Barrels Upper District Oil, subject to your customary rules and regulations, and charge to account of Charles A. White.

1,500 Bbls.

CHAS. A. WHITE, Oil Producer.
E. W. TIBBALLS, Purchasing Agent.

RUN TICKETS.

SOUTH WEST PA. PIPE LINES.

Dist. No. 10. McDonald, Pa., Jan. 2, 1905.

Ticket No. 44,000. Steamed 80 Degs. Cold 35 Degs.

Forest Oil Company, Owner.
James Robb Farm.

TANK NO. 2,200			FEET	INCHES	Office Calculations
SIZE 250	OIL	First Meas't	7	2	
		Second Meas't	1	3	
WELL NOS 1, 2 and 3	B. S.	1st M.			
		2d M.			
	WATER	1st M.			
		2d M.			

By Jerry Berry, Gauger.

Delivered to Greggs Station.

Remarks:
Pennsylvania fifth sand oil.

Time	1st Meas. 8 A. M.	Witness	JERRY BERRY, Gauger
Time	2d Meas. 2 P. M.	Witness	JERRY BERRY, Gauger

THIS TICKET COVERS ALL CLAIM FOR ALLOWANCE.

This oil is received into the general stock of the South West Pennsylvania Pipe Lines for transportation and delivery at any delivery point of the SOUTH WEST PENNSYLVANIA PIPE LINES, subject to terms and conditions heretofore agreed upon.

PRODUCERS AND REFINERS OIL CO., LIMITED.

January 10, 1905.
No. 1. Steamed 80 Degs.
Dist. 1,350. Cold 34 Degs.
Delivered to Ewing Station.
Account of M. Murphey.
Well 6, Morgan Heirs' Farm.

TANK NO.	1st Gauge		2d Gauge		B. S. & Water	
	Ft.	In.	Ft.	In.	Ft.	In.
220						
SIZE 250	7	4	1	1		

Witness	1st gauge.....M.	H. BEIRTNER
	2d gauge.....M.	H. BEIRTNER

This oil is received into the general stock of Producers and Refiners Oil Company, Limited, subject to a transportation charge of twenty cents per barrel, and a storage charge at the rate of twenty-five cents per day per thousand barrels. But is not chargeable with any assessment for losses of oil in the general stock, resulting from lightning, fire, storms, or other unavoidable causes.

Three run tickets are issued for each tank of oil run. The gauger retains one, one is given to the owner of the oil and the third is sent to the district pipe line office.

TELEGRAPH REPORT.

Sender	Time Sent
O. W. P.	2 P. M.
Receiver	Time Rcd.
B. F. W.	2.05 P. M.

NATIONAL TRANSIT COMPANY OIL CITY, PA.

TELEGRAM

McDonald, Pa., 1-10, '05

Time Filed.....2:10 p. m.

South Penn Oil Company:

McDonald Heirs' Farm, tank No. 22,100 ,McDonald district, run 7-4 to 1-1.

Bookhammer.

This blank to be used for telegrams only.

WORKING AND ROYALTY INTERESTS.

Working interest is usually seven-eighths, and royalty one-eighth. The royalty is deducted from all oil run into the pipe lines and is held in reserve for the royalty or property owner. The remaining seven-eighths is divided equally between the share or working interest holders, known as the operators or owners of the well.

STEAMING OIL IN THE TANKS.

During the winter months the oil in the stock tanks becomes chilled and too thick to run in the pipe lines. Steam was used to heat the oil at the beginning of the oil industry on Oil Creek. Steam connections were made direct from the boiler to the tank, the steam escaping with the oil near the bottom of the tank, and the force required to send the steam down through the oil would mix the B. S., non-merchantable oil on the bottom of the tank, with the good oil. The steam would condense into water, and the oil, B. S. and water would mix together, which would require two or three days to settle the water, B. S. and oil. The water being the heaviest would settle to the bottom of the tank, near the bottom of which a hole was bored, in which a plug was driven, and when it was desired to draw the water from the tank the plug would be pulled and the water allowed to run out until the oil began to appear in it. The plug was then driven into the tank and the pipe line gauger was notified that the oil was steamed, settled and the water drawn off. The gauger would call and test the oil. If it was warm enough and free from water and clear he would gauge it and run it into the pipe line. If the oil was not settled or warm enough he would not accept it but would return in a day or two and again test it. This was a great annoyance to both the producer and pipe line company, and led to the invention of two-inch steam coils for tanks. The coils are placed within four inches of the bottom of the tank; the steam connections are made from the top of the tank and pass down through the oil and connect with the coil. An outlet of the coil is made by extending one end out through the tank on the end of this outlet a stopcock is screwed, which is used to regulate the steam in the coil and not allow only the condensed water to escape. The steam passing through the coil heats the oil. (See illustrated plan of 2-inch steam coils for oil tanks.)

Summary of Statements Made January 9th, 1904, Relating to Business of Various Pipe Lines for Month Ending December 31st, 1903—In Barrels of Forty-two Gallons Each.

	Total Liabilities	Gross Stock	Sediment and Surplus	Runs From Wells	Other Receipts	Regular Deliveries	Other Deliveries
National Transit Co.	1,037,457.96	1,900,440.79	862,982.83	428,964.26	603,738.75	792,646.23	294,767.14
Southwest Pa. Pipe Lines	706,768.97	849,490.75	142,721.78	253,528.90	197,880.68	65,215.49	400,226.14
The Eureka Pipe Line Co.	1,009,471.78	1,312,302.18	302,830.40	989,020.96	446,572.22	42,940.24	1,262,191.27
The Buckeye Pipe Line Co. Macksburg Division.	472,149.85	646,302.01	74,152.16	398,358.03	10,954.38	9,440.61	386,078.43
Cumberland Pipe L. Co., Inc.	408,377.79	425,644.90	17,267.11	47,500.12	.....	21,991.10	41,134.93
Southern Pipe Line Co.	429,547.53	471,820.75	42,273.22	.....	1,053,371.33	680,480.91	420,450.74
The Crescent Pipe Line Co.	154,177.01	173,323.61	19,146.60	.....	200,250.63	130,606.40	.....
New York Transit Co.	7,504.57	58,533.51	51,028.94	.....	213,000.89	270,638.56	.....
	4,225,455.46	5,837,858.50	1,612,403.04	2,117,372.27	2,725,768.88	2,013,959.54	2,804,848.65
The Buckeye Pipe Line Co. and other Lines handling Lima Oil	15,138,637.33	18,270,798.77	3,132,161.44	1,694,567.56	158,761.58	2,129,945.63	.....

TOTAL LIABILITIES OF THE NATIONAL TRANSIT COMPANY CONSIST OF

Outstanding acceptances and other vouchers	210,000.00
Credit balances	827,457.96

TOTAL LIABILITIES OF THE BUCKEYE PIPE LINE COMPANY AND OTHER LINES HANDLING LIMA OIL CONSIST OF

Outstanding acceptances	4,500,000.00
Credit balances	10,638,637.33

The gross stocks of The Buckeye Pipe Line Company, and other Lines handling Lima Oil, include all Lima Oil in iron tanks in Indiana, Pennsylvania and New York.

WELLS CONNECTED WITH THE PIPE LINES.

Eighty-seven thousand producing oil wells are connected with the Standard Oil Company's pipe lines and 5,000 with the Independent pipe lines.

The trunk pipe lines from the oil fields to the seaboard at the present time are:

The Cumberland (Kentucky) pipe line, from Olympus, Tennessee, to Braden Station, Tyler county, West Virginia. The route and size of line and location of pump stations are as follows: First

pump station at Olympus, Pickett county, Tenn.; sixty miles of 2, 4, and 5-inch pipe line to Somerset station, Pulaski county, Ky.; forty miles of 5-inch pipe line from Somerset to Winchster intersecting station, with 3-inch branch line, 17 miles in length, from Barboursville, Knox county, Ky., to Winchester station, Perry county, Ky.; Winchester station to Licking Run, Magoffin county, Ky.; 68 miles 5-inch line intersects with 4-inch branch line, 41 miles in length, from Ragland, Bath county, to Licking Run, Magoffin county, Ky.; Beaver Creek, Floyd county, Ky., station 3-inch line 40 mils in length to Licking Run intersecting station; Licking Run station to White House Rack, Johnson county, Ky.; 30 miles 6-inch line White House Rack, Johnson county, Ky., to Hamlin, Lincoln county, West Virginia, intersecting station 40 miles of 6-inch line, Milton, Cabell county W. Va.; 2-inch branch line, 20 miles in length, from Milton, Cabell county, W. Va., to Hamlin intersection station; Hamlin, Lincoln county, W. Va., to Elm Run station, Ritchie county, W. Va.; 83 miles of 6-inch line Elm Run to Braden intersection station, Tyler county, W. Va.; 31 miles 6-inch line, Buckeye-Macksburg pipe line, Vinton Creek station, Vinton county, O., to Wolf Creek station, Athens county, O., 43 miles of 3-inch line Wolf Creek, Athens county, to Lowell station, Washington county, O.; 13 miles 4-inch line, Lowell, O., to Eureka intersection station, Eureka, Pleasants county, W. Va.; 18 miles of 6-inch line, Corning station, Perry county, O., to Elba Junction; 32 miles of 4-inch line branch to Elba, Washington county, O.; 4-inch line, 2½ miles in length, Elba Junction, O., to Eureka intersection station, Pleasants county, W. Va.; 20 miles 4-inch line, Payne station, Washington county, O., to Eureka station, 9 miles 4-inch line, Eureka pipe line, Eureka intersection station, Eureka, Pleasants county, W. Va., to Braden intersection station, Tyler county, W. Va.; 31 miles of 6-inch line, Sistersville (Thistle station), Tyler county, W. Va., to Braden intersection station, 12 miles of 6-inch line; Braden intersection station, Tyler county, W. Va., to Downs intersection station, Marion county, W. Va., 25 miles 6-inch line; Sand Fork Station, Lewis county, W .Va., to Ten-Mile station 32 miles of 6-inch line; Ten-Mile station to Downs intersection station 19 miles of 6-inch line; Downs intersection station, Marion county, W. Va., to Ewing intersection station, Washington county, Pa., 50 miles of 6-inch line; Downs intersection station to Dolls Run Junction, Monongahela county, W. Va., 16 miles of 6-inch line; Ewing station, Washington county, Pa., to Dolls Run Junction, Monongahela county, W. Va., 41 miles of 6-inch line; Dolls Run Junction to Morgantown intersection station, Monongahela county, W. Va., 9 miles of 6-inch line; Downs intersection station, Marion county, W. Va., to Morgantown intersection station, Monongahela county, W. Va., 21 miles of 6-inch line

SOUTHERN PIPE LINE.

Morgantown station, Monongahela county, W. Va., 6 and 8-inch trunk line to Watson station, Fayette county, Pa.; Watson station to State Line station, Bedford county, Pa.; State Line station to Knepper station, Franklin county, Pa.; Knepper station to Millway station, Lancaster county, Pa.; Millway station to Philadelphia terminus oil refinery, Point Breeze, Chester county, Pa.; Millway station, Lancaster county, Pa., to Baltimore terminus oil refinery, Baltimore, Md.; Millway station, Lancaster county, Pa., to Bayonne seaboard terminus oil refinery, Bayonne, Hudson county, N. J.

THE PRAIRIE OIL AND GAS COMPANY PIPE LINE.

W. J. Young, President, Pittsburg, Pa.; D. J. O'Day, General Manager, Lima, O.; W. F. Gates, Superintendent, Independence, Kan.

From Red Fork, Creek Nation, Indian Territory, to Kansas City, Kan. The stations on the line are as follows: Red Fork , Indian Territory, station to Territory line station 6-inch line, Chelsea; Cherokee Nation station to Territory line station via Bartlesville, Cherokee Nation, to Lawton station; Cherokee Nation 6-inch line, Lawton to Cleveland, Oklahoma Junction 6-inch line Cleveland, Oklahoma, Osage Nation, to Cleveland Junction, Cherokee Nation, 4-inch line; Cleveland Junction via Caney, Montgomery county, Kan., to Peru Junction, Kan., 6-inch line; Peru, Chautauqua county, to Peru Junction, 3-inch line; Peru Junction, Kan., to Independence, Montgomery county, Kan., 6-inch line; Coffeyville, Montgomery county, Kan., to Independence, Kan., 3-inch line; Independence to Neodesha, Wilson county, Kan., 6-inch line; Cherry Vale, Montgomery county, Kan., to Neodesha, Kan., 3-inch line; Neodesha, Kan., 6-inch line; Neodesha via Chaunte, Neosha county, to Humboldt, Allegheny county, Kan., 6-inch line; Humboldt via Iola to Garnett, Anderson county, Kan., 6-inch line; Garnett to Paola, Miami, Kan., 6-inch line; Paola to Kansas City, Wyandotte county, Kan., 6-inch

KANSAS AND INDIANA PIPE LINE.

Kansas City, Kan., to Whiting, Ind., 6-inch line.

INDIANA PIPE LINE.

Whiting, Lake county, Ind., terminal; Whiting to Wilders station, Kankakee, Stark county, Ind., 8-inch line; Wilders station to Laketon station, Wabash county, Ind., 8-inch line; Laketon station to Preble station, Adams county, Ind., 8-inch line; Preble station to Montpeller station, Wells county, Ind., 6-inch line; Montpeller station to Broad Ripple station, Marion, Marion county, Ind.; Preble sta-

tion, Adams county, Ind., to Adgate station, Lima, O., 8-inch line. The Indiana trunk pipe line follows the route of the Chicago and Alton (Erie) railroad right of way from Lima, O., to Whiting, Ind.

THE BUCKEYE PIPE LINE.

St. Mary's station, Auglaize county, O., to Adgate station, Lima, O., 6-inch line; Adgate station to Cygnet station, Wood county, O., via Findlay and North Baltimore, O., 8-inch line; Tontogany station, Wood county, O., via Bowling Green, O., to Cygnet station, O., 6-inch line; Cygnet station to Rollersville station, Sandusky county, O., 6 and 8-inch lines; Rollersville station to Toledo terminal 6-inch line; Rollersville station to Green Springs Junction station, Senaca county, O., 8-inch line; Cygnet station, Wood county, O., to Green Springs Junction station, Senaca county, O., 8-inch line; Green Springs Junction station to Wakeman station, Huron county, O., 8-inch line; Wakeman station to Berea station, Loraine county, O., 8-inch line; Berea station to Mantua station, Portage county, O., 8-inch line Mantua station to Cleveland, O., Lake Erie terminal, 6-inch line; Mantua station to Warren station, Trumbull county, O., 8-inch line; Warren, O., station to Simpson station, Lawrence county, Pa., 8-inch line; Simpson station to Bear Creek station, Armstrong county, Pa., 8-inch line; Bear Creek pump station is known as the mixing station. This station supplies all the trunk lines with Pennsylvania and Lima, O., and Indiana mixed crude oil.

THE NATIONAL TRANSIT COMPANY'S PIPE LINES.

The general head division of all the Standard Oil Company's pipe lines united into one grand division, operating under the charter granted the Pennsylvania Company by act of the legislature of Pennsylvania, April 7, 1870. The charter of the Pennsylvania Company was purchased by the National Transit Company March 8, 1881, for $16,250. On May 12, 1884, the United and numerous other pipe lines were transferred to the National Transit Company. The officers of the National Transit Company are as follows: Henry H. Rogers, President; Daniel O'Day, Vice President; John Bushnell, Controller; George Cheseboro, Assistant Controller; George W. Colton, Treasurer; W. A. Harris, Assistant Treasurer; F. M. Towl, General Superintendent; D. S. Bushnell, Assistant General Suprintendent; Forrest M. Toll, Constructing Engineer. General office, Standard Oil Building, 26 Broadway, New York.

National Transit Company United Pipe Lines, Upper Division, John O'Brien, Superintendent, Bradford, Pa.

National Transit Company United Consolidated, Eureka, Southern, Cumberland (Kentucky) Mellon-Crescent, South West Pennsylvania, Buckeye-Macksburg, Lower Division, Henry G. Scrafford, Superintendent, Pittsburg, Pa.

THE NATIONAL TRANSIT.

Names and route of the several trunk pipe lines in the United and Consolidated Grand Division of the National Transit Company:

Mellon Pipe Line (five-inch line)—Sistersville, W. Va., to Littleton, W. Va.; Littleton, W. Va., to Anderson, Pa.; Anderson, Pa., to Ewing, Pa.

South West Pennsylvania Pipe Line (two, three, four, five and six-inch line)—Taylorstown, Pa., to Cundall, Pa.; Cundall, Pa., to Ewing, Pa.; Washington, Pa., to Ewing, Pa.; McDonald and Oakdale, Pa., to Greggs Station, Pa.; Greggs Station to Ewing, Pa.; Ewing, Pa., to Nedsky, Pa.; Greggs Station, Pa., to Nedsky, Pa.

Crescent Pipe Line (five-inch line)—Greggs Station, Pa., to Millbank, Pa.; Millbank to Ingleside, Pa.; Ingleside to Saxton, Pa.; Saxton to Hays Grove, Pa.; Hays Grove to Florinel, Pa.; Florinel to Marcus Hook, Pa. Seaboard Terminal Refinery, Philadelphia, Pa.

National Transit Company—United Pipe Lines Division (four, five, six and eight-inch lines)—Scio, O., to Turkey Foot, W. Va.; Turkey Foot to Ewing and Shannapin, Pa.; Ewing Station, Pa., to Shannapin Station, Pa.; Shannapin to Nedsky Station, Pa.; Ewing Station, Pa., to Nedsky Station, Pa.; branch line from Nedsky Station to Allegheny, Pa.; Nedsky Station, Pa., to Bear Creek Station, Pa.; Bear Creek Station to Crown Station, Pa.; Crown Station to Kane Station, Pa.; Kane Station to Colegrove Station, Pa.; Colegrove Station to Hunt's Run Station, Pa.; Hunt's Run to North Point Station, Pa.; North Point Station to Pine Station, Pa.; Pine Station to Latshaw Station, Pa.; Latshaw Station to Millway; intersection station to Point Breeze; Seaboard Terminal Refinery, Philadelphia, Pa.; Millway Station to Baltimore, Md., Seaboard Terminal Refinery; Millway Station, Pa., to Bayonne, N. J., seaboard terminal; Colegrove Station, Pa., to Olean, N. Y., intersection station; Kane Station, Pa., to Olean, N. Y., intersection station, to Buffalo, N. Y., lake terminal; Olean Station, N. Y., to Wellsville Station, N. Y.; Wellsville Station to Cameron Mills Station, N. Y.; Cameron Mills Station to West Junction Station, N. Y.; West Junction Station to Catatonk Station, N. Y.; Catatonk Station to Osborne Hollow Station, N. Y.; Osborne Hollow to Hancock Station, N. Y.; Hancock Station to Cochecton Station, N. Y.; Cochecton Station to Swartwout Station, N. Y.; Swartwout Station to New Foundland Station, N. J.; New Foundland Station to Saddle River Junction Station, N. J.; Saddle River Junction Station to Terminal Refinery, Brooklyn, N. Y.; Saddle River Junction Station to the Seaboard Terminal Refinery, Bayonne, N. J.

Pacific Coast Oil Company Pipe Line, California (Standard Oil Company)—Length of line, 280 miles; size of line, eight inches. Route of line: Waite Station, Kern county ,Cal., to Pond Station, Kern county; Pond Station to Corcoran Station, Tulare county, Cal.; Corcoran Station to Lethent Station, Fresno county, Cal.; Lethent Station to Mendota intersecting station, Fresno county, Cal.; Colinga branch line station, Fresno county, Cal., to Mendota intersecting station; Mendota intersecting station to Los Palos Station, Fresno county, Cal.; Los Palos Station to Newman Station, Merced county, Cal.; Newman Station to Vernalis Station, San Jaquin county, Cal.; Vernalis Station to McCabe Station, Contra Costa county, Cal.; McCabe Station to Maltby Station, Contra Costa county, Cal.; Maltby Station to Port Richmond Terminal Refinery, San Francisco Bay, Cal.

Security Oil Company Pipe Line, Texas (Standard Oil Company)—Size of line, eight inches. Route of line· Batson to Sour Lake, Sour Lake to Beaumont, Beaumont to Sabine Pass, Seaboard Terminal Refinery.

Tidewater Pipe Line Company, Limited (operated under agreement with the Standard Oil Company)—Size of line, six inches. Route of line: Tarport, East Bradford, Pa,. to Station No. 1, Rixford, Pa.; Station No. 1 to Station No. 2, Olmsted, Pa.; No .2 Station to No .3 Station, County Line, Pa.; Station No. 3 to Station No. 4, Muncy Station, Pa.; Station No. 4 to Station No. 5, Shumans, Pa.; Station No. 5 to Station No. 6, Hudsondale, Pa.; Station No. 6 to Station No. 7, Changewater, N. J.; Station No. 7 to Seaboard Terminal Refinery, Bayonne, N. J.

United States Pipe Line Company (Independent and Standard)—Incorporated September 6, 1892. Capital stock, $2,000,000. Michael Murphy, President; J. W. Lee, Vice President; I. G. Jackson, Secretary; W. W. Tarbell, Treasurer; H. J. Wing, Superintendent. Directors: Michael Murphy, New York; R. M. Jennings, Pittsburg, Pa.; Louis Walz, Oil City, Pa.; Delevan Emery, Bradford, Pa.; Hugh King, New York; Peter Theobold, Titusville, Pa.; J. W .Lee, Pittsburg, Pa.; Thomas W. Phillips, New Castle, Pa.; Joseph Seep, C. N. Payne, Titusville, Pa.; J. C. McDowell, Pittsburg, Pa.

Crude and refined lines; size of lines, four and five inches. Route of lines: Titusville, Pa., to Warren, Pa., 31 miles; crude line five inches, refined line four inches; Warren, Pa., to Bradford, Pa., 30½ miles; crude line five inches, refined line four inches; Bradford, Pa., to Westfield Station, Pa., 57½ miles; crude line four inches, refined line five inches Westfield Station, Pa., to Athens Station, Pa., 53 4-5 miles; crude line four inches, refined line five inches; Athens to Parkson Station, 63 3-5 miles; crude line four inches, refined line five inches; Parkson to Freemansburg, Pa., loading rack, 59 miles; Freemansburg to Marcus Hook Terminal Refinery, Philadelphia, Pa., 64.1 miles; crude line four inches, refined line five inches.

Producers and Refiners Pipe Line Company, Limited (Independent)—Size of line, two, four and six inches. Route of line: Trail Run (O.) Station to Sistersville Station, W. Va.; Sistersville Station to Pine Grove Station, W. Va.; Pine Grove Station, W. Va., to Taylorstown Station, Pa.; Taylorstown Station to Washington Junction, Pa.; Washington, Pa., field station to Washington Junction; Washington Junction to Primrose Station, Pa.; Primrose Station to Coraopolis Station, Pa.; Primrose Station, via McDonald, Noblestown and Oakdale, Pa., to Coraopolis Station; Coraopolis to Adams Station, Pa.; Adams to Butler, Pa.; Butler to Karns City, Pa.; Karns City to Dotters Station, Pa.; Dotters Station to Oil City, Pa.; Oil City to Titusville, Pa., then intersecting with the United States Pipe Lines.

Emery Pipe Line (Independent)—Lewis Emery, Jr., owner. Route and size of line: Sugar Run, Pa., to Sarksville, Pa., 40 miles, three and four-inch line; Riterville to Bradford, Pa., 18 miles, three and four-inch line.

TEXAS PIPE LINES.

Higgins Pipe Line, from Batson to Sour Lake; six-inch line.

United Oil and Refining Company, Sour Lake to Beaumont; six-inch line.

National Oil and Pipe Line Company, Beaumont to Port Arthur; six-inch line.

Franklin Pipe Company, Limited, Franklin, Pa. J. W. Grant, President; D. Grimm, Secretary; E. Black, Superintendent. Size of pipe line, two, three and four inches. Route of line: Franklin oil field to refinery and loading rack, Franklin, Pa.

Cornplanter Pipe Line Company, Warren, Pa. Size of pipe line, two inches. Route of line: Tiona, Clarendon, Stoneham, Glade Run and Glade to refinery, East Warren, Pa.

GENERAL CORPORATION.

CODE OF WEST VIRGINIA LAWS.

OF REGULATIONS CONCERNING TRANSPORTATION OF PETROLEUM BY PIPE LINES, OR STORAGE BY TANKS.

CHAPTER XV.

From Chap. 44 Acts 1891, which amended Chap. 27 Acts 1879, entitled "An act prescribing regulations for the transportation of petroleum or other oils or liquids by railroad companies or transportation companies or through pipes of iron or other material constructed for that purpose."

The sections in this chapter bear the same numbers as in the Acts of 1891.

As to appropriation of land, see Section 41 of Chap. 21 of this book.

Certain pipe line companies are common carriers, Section 41 of Chap. 21 of this book.

WHAT PERSONS AND CORPORATIONS ARE SUBJECT TO THIS ACT.

1. Every person, corporation or company now engaged, or who shall hereafter engage or continue in the business of transporting or storing petroleum, by means of pipe line or lines or storage by tanks, shall be subject to the provisions of this act, and shall conduct such business in conformity herewith; and the word company whenever used in this act shall be construed to include persons and corporations.

MUST ACCEPT ALL PETROLEUM OFFERED.

2. Any company heretofore or hereafter organized for the purpose of transporting petroleum or other oils or liquids, by means of pipe line or lines, shall be required to accept all petroleum offered to it in merchantable order in quantities of not less than two thousand gallons at the wells where the same is produced, making at its own expense all necessary connections with the tanks or receptacles containing such petroleum, and to transport and deliver the same at any delivery station, within or without the state, on the route of its line of pipes which may be designated by the owners of the petroleum so offered.

PETROLEUM TO BE INSPECTED, MEASURED AND RECEIPTED FOR.

3. All petroleum of a gravity of thirty-five degrees Baume or under at a temperature of sixty degrees Fahrenheit, offered for transportation by means of pipe line or lines, shall, before the same is transported, as provided by section two of this act, be inspected, graded and measured, at the expense of the pipe line company, and the company accepting the same for transportation shall give to the owner thereof a receipt stating therein the number of barrels or gallons so received and the grade, gravity and measurement thereof, and within a reasonable time thereafter, upon demand of said owner or his assigns, shall deliver to him at the point of delivery a like quantity and grade or gravity of petroleum in merchantable condition as specified in said receipt; except that the company may deduct for waste one per centum of the amount of petroleum specified in such receipt.

CHARGE FOR TRANSPORTING OIL.

4. The charge for receiving, transporting and delivering petroleum of the gravity of thirty-five degrees Baume or under at a temperature of sixty degrees Fahrenheit by means of pipe line or lines, shall not exceed one cent per barrel of forty-two gallons, per mile: provided, that if said rate should amount for the whole distance transported to less than ten cents per barrel, then the sum of ten cents per barrel may be charged; provided, that if the distance be over twenty miles and not more than thirty miles, one-half cent per barrel may be charged for every mile over twenty miles; and provided, further, that if the distance be over thirty miles, the maximum charge shall not exceed twenty-five cents.

CHARGE FOR STORAGE AND ALLOWANCE FOR WASTE.

5. Any company engaged in storing petroleum of a gravity of thirty-five degrees Baume or under, at a temperature of sixty degrees Fahrenheit, by means of tanks, shall be permitted to charge for storage one cent per barrel per month or part of a month, unless the same is removed within fifteen days from the date when said oil is received into the custody of such company, and shall be allowed for evaporation and waste one-half of one per centum of the oil per month, unless removed within thirty days from the date of the receipt of such petroleum; but no company engaged in the business of storing petroleum of the gravity of thirty-five degrees Baume or under, at a temperature of sixty degrees Fahrenheit, shall charge for storage any amount in excess of that authorized by this section.

OIL EXCEEDING 35 DEGREES TO BE INSPECTED, ETC.

6. All petroleum of a gravity exceeding thirty-five degrees Baume at a temperature of sixty degrees Fahrenheit, offered for transportation by means of pipe line or lines, shall be inspected and measured at the expense of the company transporting the same, before the same is transported; and the company accepting the same for transportation, shall give to the owner thereof, or to the person in charge of the well or wells, from which such petroleum has been produced and run, a ticket signed by its gauger, stating the number of the feet and inches of petroleum which were in the tank or receptable containing the same before the company began to run the contents from said tank, and the number of feet and inches of petroleum which remained in the tank after said run was completed; and all deductions made for water, sediment or the like, shall be made at the time such petroleum is measured; and within reasonable time thereafter said company shall, upon demand, deliver, from the petroleum in its custody to the owner thereof, or to his assignee, at such delivery station on the route of its line of pipes as he may elect a quantity of merchantable petroleum, equal to the quantity of petroleum run from said tank, or receptacle, which shall be ascertained by computation; except that the said company transporting said petroleum may deduct for evaporation and waste two per centum of the amount of petroleum so run, as shown by said ticket; and except that in case of loss of any petroleum or other like unavoidable cause, such loss shall be borne pro rata by all the owners of such petroleum at the time thereof. But said company shall be liable for all petroleum that is lost while in its custody by the bursting of pipes or tanks, or leakage from pipes or tanks; and it shall also be liable for all petroleum lost from tanks at the

wells where produced before the same has been received for transportation if such loss be due to faulty connections made to said tanks; and said company shall be liable for all petroleum lost by overflow of any tanks with which pipe line connections have been made, if such overflow be due to the negligence of such company; and for all the petroleum lost by the overflow of any tanks with which pipe line connections should have been made under the provisions of this act, but were not so made by reason of negligence or delay on the part of said company.

CHARGE FOR TRANSPORTING OIL EXCEEDING 35 DEGREES.

7. Any company engaged in transporting petroleum of a gravity exceeding 35 degrees Baume at a temperature of 60 degrees Fahrenheit, by means of pipe line or lines, may charge for receiving, transporting and delivering such petroleum not to exceed twenty cents per barrel for each barrel of forty-two gallons; provided, however, if where the point of delivery is without this State, more than twenty cents per barrel be charged, then there shall be charged no greater sum than ten cents per barrel for receiving such oil and transporting the same that part of the distance which is within this State.

CHARGE FOR STORAGE.

8. Any company engaged in transporting or storing petroleum of a gravity exceeding 35 degrees Baume, at a temperature of 60 degrees Fahrenheit, by means of pipe lines and tanks, shall make no charge for storing said petroleum until after the expiration of the month following that in which the oil was run and received into custody. But it may charge for storing said petroleum of a gravity exceeding 35 degrees Baume at a temperature of 60 degrees Fahrenheit, for every day after the expiration of the month following that in which said oil shall have been run and received into custody, not to exceed one-fortieth of one per cent. per barrel of forty-two gallons for each day thereafter said oil shall continue to remain in its custody. And such company shall make no charge for water, sediment, waste and the like in transporting or storing any petroleum after the same has been gauged or measured, before the run of the same is made, except the two per centum for waste and evaporation hereinbefore mentioned.

CHARGES TO BE UNIFORM.

9. No company engaged in transporting or storing petroleum by means of pipe line or lines and tanks shall charge, demand or receive from any corporation, company, association, person or persons a greater or less rate for the transportation or storage of petroleum than it charges, receives or demands from any other corporation, company, association, person or persons for the transportation or storage of petroleum of like gravity; and any shift, device, or subterfuge made or attempted for the purpose of avoiding the provisions of this section shall be void.

VIOLATIONS—HOW PUNISHED.

10. Any company, its officers or agents, wilfully violating any of the provisions of Sections 2, 3, 4, 5, 6, 7, 8 or 9 of this act, or charging for any of the services provided for in any of said sections, an amount in excess of that authorized by said sections, shall be guilty of a misdemeanor, and on conviction thereof shall be fined not less than one hundred dollars, nor more than one thousand dollars, and shall moreover be liable to the party aggrieved for all damages sustained by him by reason of such excessive charges.

LIEN FOR CHARGES.

11. Any company engaged in transporting or storing petroleum shall have a lien upon said petroleum until all charges for transporting and storing said petroleum are paid.

ACCEPTED ORDERS AND CERTIFICATES NEGOTIABLE.

12. Accepted orders and certificates for petroleum issued by any company engaged in the business of transporting and storing petroleum in this State, by means of pipe line or lines and tanks, shall be negotiable, and may be transferred by endorsement, either in blank or to the order of another, and any person to whom the said accepted orders and certificates shall be so transferred shall be deemed and taken to be the owner of the petroleum therein specified.

PROVISIONS GENERALLY RESPECTING RECEIPTS, CERTIFICATES, ORDERS, ETC.

13. No receipt, certificate, accepted order or other voucher shall be issued or put in circulation, nor shall any order be accepted or liability incurred for the delivery of any petroleum, crude or refined, unless the amount of such petroleum represented in or by such receipt, certificate, accepted order or other voucher or liability, shall have been actually received by and shall then be in the tanks and lines, custody and control of the company issuing or putting in circulation such receipt, certificate, accepted order or voucher, or written evidence of liability. No duplicate receipt, certificate, accepted order or other voucher shall be issued or put in circulation, or any liability incurred for any petroleum, crude or refined, while any former liability remains in force, or any former receipt, certificate, accepted order or other voucher shall be outstanding and uncancelled, except such original paper shall have been lost, in which case a duplicate plainly marked "duplicate" upon the face, and dated and numbered as the lost original was dated and numbered, may be issued. No receipt, voucher, accepted order, certificate or written evidence of liability of such company on which petroleum, crude or refined, has been delivered, shall be re-issued, used or put in circula-

tion. No petroleum, crude or refined, for which a receipt, voucher, accepted order, certificate or liability incurred shall have been issued or put in circulation, shall be delivered, except upon the surrender of the receipt, voucher, order or liability representing such petroleum, except upon affidavit of loss of such instrument made by the former holder thereof. No duplicate receipt, certificate, voucher, accepted order or other evidence of liability shall be made, issued or put in circulation until after notice of the loss of the original, and of the intention to apply for a duplicate thereof, shall have been given by advertisement over the signature of the owner thereof in at least four successive issues of a daily or weekly newspaper published in the county where such duplicate is to be issued. Every receipt, voucher, accepted order, certificate or evidence of liability, when surrendered, or the petroleum represented thereby delivered, shall be immediately cancelled by stamping and punching the same across the face in large and legible letters with the word "cancelled," and giving the date of such cancellation; and it shall then be filed and preserved in the principal office of such company for the period of six years.

14. No company, its officers or agents, or any person or persons engaged in the transportation or storage of petroleum, crude or refined, shall sell or encumber, ship, transfer, or in any manner remove or procure, or permit to be sold, encumbered, shipped, transferred, or in any manner removed from the tanks or pipes of said company engaged in the business aforesaid, any petroleum, crude or refined, without the written order of the owner or owners thereof.

COMPANY TO MAKE AND POST SHIPMENT OF BUSINESS.

15. Every company now or hereafter engaged in the business of transporting by pipe lines, or storing crude or refined petroleum in this State, shall, on or before the tenth day of each month, make or cause to be made and posted in its principal business office in this State, in an accessible and convenient place for the examination thereof by any person desiring such examination, and shall keep so posted continuously until the next succeeding statement is so posted, a statement plainly written or printed, signed by the officer, agent, person or persons having charge of the pipes and tanks of said company, and also by the officer or officers, person or persons, having charge of the books and accounts thereof, which statement shall show in legible and intelligent form the following details of the business:

First—How much petroleum, crude or refined, was in the actual and immediate custody of such company at the beginning and close of the previous month, and where the same was located or held; describing in detail the location and designation of each tank or place of deposit, and the name of its owner.

Second—How much petroleum, crude or refined, was received by such company during the previous month.

Third—How much petroleum, crude or refined, was delivered by such company during the previous month.

Fourth—How much petroleum, crude or refined, such company was liable for the delivery or custody of, to other corporations, companies or persons at the close of the month.

Fifth—How much of such liability was represented by outstanding receipts or certificates, accepted orders or other vouchers, and how much was represented by credit balances.

Sixth—That all the provisions of this act have been faithfully observed and obeyed during the said previous month.

The statement so required to be made shall also be sworn to by said officers, agent, person or persons before some officer authorized by law to administer oaths, which oath shall be in writing, and shall assert the familiarity and acquaintance of the deponent with the business and conditions of such company, and with the facts sworn to, and that the statements made in the said report are true.

16. All amounts in the statements required by this act, when the petroleum is handled in bulk, shall be given in barrels and hundredths of barrels, reckoning forty-two gallons to each barrel, and when such petroleum is handled in barrels or packages, the number of such barrels or packages shall be given, and such statements shall distinguish between crude and refined petroleum, and give the amount of each. Every company engaged in the business aforesaid shall at all times have in their pipes and tanks an amount of merchantable oil equal to the aggregate of outstanding receipts, certificates, accepted orders, vouchers, acknowledgements, evidences of liability and credit balances on the books thereof.

PENALTY FOR CERTAIN VIOLATIONS.

17. Any company, its officers or agents, who shall make or cause to be made, sign or cause to be signed, issue or cause to be issued, put in circulation or cause to be put in circulation, any receipt, accepted order, certificate, voucher or evidence of liability, or shall sell, transfer or alter the same, or cause such sale, transfer or alteration, contrary to the provisions of this act, or shall do or cause to be done, any of the acts prohibited by the thirteenth section of this act, or omit to do any of the acts by said section directed, shall be guilty of a misdemeanor, and on conviction thereof shall be sentenced to pay a fine of not exceeding one thousand dollars, and undergo imprisonment not less than ten days nor exceeding one year.

PENALTY FOR SELLING WITHOUT OWNER'S CONSENT.

18. Any company engaged in the business of transporting by pipe transfer or remove, or cause or procure to be sold, transferred or removed from the tanks or pipes of such company, any petroleum, crude or refined, without the written consent of the owner or owners thereof, shall be guilty of a

misdemeanor, and on conviction thereof shall be sentenced to pay a fine of one thousand dollars and undergo an imprisonment of not less than ninety days and not exceeding one year.

PENALTY FOR FAILURE TO MAKE STATEMENT REQUIRED.

19. Any company engaged in the business of transporting by pipe lines or storing petroleum, crude or refined, and each and every officer or agent of such company who shall neglect or refuse to make the report and statement required by the fifteenth section of this act, within the time and in the manner directed by said section, shall forfeit and pay the sum of one thousand dollars, and in addition thereto the sum of five hundred dollars for each day after the tenth day of the month that the report and statement required by said section fifteen shall remain unposted as therein directed.

APPOINTMENT OF EXAMINERS—THEIR DUTIES, ETC.

20. The holders of any receipts, certificates, accepted orders, or other vouchers or evidences of liability, or the owners of oil in the custody of any such company described and referred to in this act, to an amount not less in the aggregate than ten thousand barrels of petroleum, crude or refined, may at any time present their petition to the circuit court of any county wherein such company may be engaged in business or have its principal office, or to any judge of said court in vacation, setting forth under oath their ownership as aforesaid and desire for the appointment of examiners for the purposes of this section; and upon such petitioners giving bonds to be approved by the court, or by the judge granting the order, that they will pay all expenses and costs that may accrue in the proceedings, the court, or any judge thereof in vacation, shall forthwith appoint such number of impartial, disinterested and expert persons as may be asked for in said petition, as examiners, and shall fix the amount of their compensation; and the court or judge by order shall direct and empower such examiners to immediately inspect and measure all the petroleum, crude or refined, in the custody of any such company named in the said petition, on the day of such inspection, and to examine the books of said company relating to the issue and cancellation of receipts, certificates, accepted orders, vouchers, or evidences of liability, and to its open accounts with persons, companies or corporations with whom it deals in the receipt and delivery of crude or refined petroleum. Such examiners, when so appointed, shall each immediately be sworn before any authorized officer to perform his duties with fidelity and according to law, which oath shall be reduced to writing, signed and filed with the clerk, and they shall then make immediate inspection, examination and measurement, as required by said petition and order and by this act. And it shall be the duty of each and every such company, its officers, agents and employes, to give immediately upon request of any such authorized examiners, all the information demanded in said petition and required by this act to be reported, and also full access to the offices, tanks, pipes, books and accounts of such company. Upon the completion of such inspection, measurement and examination, it shall be the duty of the examiner or examiners, or in the event of the death, resignation, declination or inability to act of any of them, then to others, or any of them, within ten days after their appointment to make to the court appointing them a written, signed and sworn report of such examination, inspection and measurement, and file the same of record with the clerk thereof, which report shall show:

First—How much merchantable and also how much unmerchantable petroleum, crude or refined, they found in the tanks and lines of such company, and where the same was located or held by description of tanks.

Second—For the custody or delivery of how much crude or refined petroleum they found such company to be liable at the same date.

Third—How much of such liability was represented by outstanding receipts, accepted orders, certificates, vouchers or evidences of liability, and how much by credit balances.

PENALTIES TO WHICH EXAMINERS ARE LIABLE.

21. Any examiner so appointd as aforesaid who shall make any false examination, inspection, measurement or report, or shall make known directly or indirectly to any person any information he may become possessed of in the course of his examination, inspection or measurement, except by means of his report made and filed in accordance with this act, or who shall receive directly or indirectly any fee, reward or benefit, or the promise of any fee, reward or benefit, other than that provided by this act, for the performance or non-performance of any duty or thing contemplated by this act, or connected with his said employment, shall be guilty of a misdemeanor, and upon conviction thereof shall be sentenced to pay a fine of one thousand dollars, and may at the discretion of the court be confined in jail not to exceed one year.

PENALTY FOR REFUSING ACCESS TO BOOKS, ETC.

22. Any officer, agent, manager, superintendent, or employe of any company engaged in the transportation by pipe lines of petroleum, crude or refined, or the storage thereof, who shall refuse or neglect after demand made to give to any authorized examiner full and free access to any and all offices, pipes, tanks, accounts, books and vouchers required by him in the pursuance of his appointment and this act, shall be guilty of a misdemeanor, and upon conviction thereof shall be sentenced to pay a fine of not exceeding one thousand dollars, and may at the discretion of the court be confined in jail not to exceed one year.

CONFLICTING LAWS REPEALED.

23. All acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

HOW PIPE LINE COMPANIES MAY ENTER UPON AND APPROPRIATE LANDS.

A company organized for the purpose of transporting natural gas, petroleum or water, necessary for use in carrying out the provisions of this act in piping and transporting natural gas and petroleum, or for drilling for the same, through tubing and pipes, may enter upon any land for the purpose of examining and surveying a line for its tubing and pipes, and may appropriate so much thereof as may be deemed necessary for the laying down of such tubing and piping, and for the erection of tanks and the location of stations along such line, and the erection of such buildings as may be necessary for the purpose aforesaid; such appropriations shall be made and conducted in accordance with the law providing for compensation to the owners of private property taken for public use; provided, that no dwelling house, yard or garden shall be taken for such purpose, nor shall any oil tank, gas or oil pipe line be erected or laid within one hundred feet of any occupied dwelling house without the consent of the owner thereof. And so far as the rights of the public therein are concerned, the county commissmissioners as to public roads, and the council of any municipal corporation as to streets and alleys, in their respective jurisdictions, may, subject to such regulations and restrictions as they may prescribe, grant to such company the right to lay such tubing and piping therein: provided, however, the right to appropriate for any of the purposes herein above specified shall not include or extend to the erection of any tank, station, or building, or lands thereof, or to more than one continuous line of pipe or tubing, or land therefor, in or through a municipal corporation without the council first consents thereto; and all excavations shall be well filled by such company, and so kept by it, in all cases. Such company shall, for the purpose of transporting natural gas, oils and water, be considered and held to be a common carrier, and subject to all the duties and liabilities of such carriers under the laws of this State. —[Code 52:24.]

EXPORT AND DOMESTIC TRADE IN PETROLEUM PRODUCTS.

Export Trade—Barrels—Cans and Cases—Shipments in Bulk—Tank Steamers and Sailing Vessels—Tank Cars—Tank Wagons—New York Produce Exchange Rules Regulating Exports—State Laws Regulating the Sale of Petroleum Products.

Export Trade — Petroleum has undoubtedly reached a wider market than any other product of American industry. Every quarter of the globe has been blessed by its beneficent light. Wherever commerce has made its way, petroleum has been taken as an article that finds ready sale. As has been said: "It is carried wherever a wheel can roll or a camel's foot be planted. The caravans on the Desert of Sahara go laden with Astral oil and elephants in India carry cases of Standard White. Ships are constantly loading at our wharves for Japan, India and the most distant isles of the sea." Everything connected with this magnificent business is of interest. We have seen that a silent revolution in the industry took place when pipe lines for the transportation of crude were found practicable. Another revolution has been experienced during the last fifteen years in the mode of carrying much of the finished oil exported. Until within this period all petroleum was delivered to foreign countries in either barrels or cases. Today the transportation of oil in bulk is becoming very general, displacing to some extent, though not altogether, shipments in barrels, and to a lesser extent, shipments in cans. The making of these packages should be briefly described.

Barrels.—When it is remembered that this outline describes the making of but one of several distinctly different kinds of packages for conveying petroleum to distant markets, that it is of course entirely separate from the manufacture of oil, but a necessary adjunct to the success of the industry, the ramifications of the manufacture of petroleum can be comprehended.

The oak staves are purchased ready jointed and seasoned in West Virginia, Tennessee and Michigan, and the barrel heads are brought to the works ready glued up. The first operation in barrel-making consists in fitting the necessary number of staves together in a thick wrought-iron ring encircling their lower ends. This is an operation requiring some experience and judgment. The embryo barrel is then placed in an iron cylinder and steamed, whereby the wood is softened. The staves are next encircled by a wire rope connected with an engine, and are thus bent into shape and drawn together, a second strong iron hoop being slipped on their upper ends to hold them in position. The barrel is then "fired" by burning some readily combustible material in the interior, and the curvature of the staves thus rendered permanent. A number of extra temporary iron hoops of great thickness are next slipped on, and drawn toward the bulge of the barrel by means of an ingenious arrangement of iron hooks or claws actuated by steam power. The final operation performed upon the staves consists in placing the barrel in a lathe, paring off the rough ends and cutting the groves for the heads.

The barrel is then ready to receive the heads and to be hooped. The hoops weigh collectively about twelve pounds, and the total length of iron required for a set is 433½ inches, so that putting the out-turn of finished barrels from one factory at 10,000 per day, we have a length of about seventy miles of hoop iron (weighing about 55½ tons) used daily.

In order to render the barrels capable of holding their fluid contents without leakage, they are coated

internally with glue, about one pound of glue to three barrels being required. The glue solution is poured into the barrels hot, the barrels bunged up and rotated so that the solution coats the entire surface, the surplus being afterwards drained out. There is some pressure of steam in the barrel during the operation, and a leak is thus at once shown. The barrels finally receive a coating of the well-known blue paint on the staves, and white paint on the heads. Oil barrels returned to be refilled are often cleaned externally by an arrangement of rapidly revolving wire brushes, are steamed out, reglued and repainted.

Before the barrels are filled, the hoops require "driving" to take up the shrinkage of the wood. This was formerly done exclusively by hand, but Mr. E. J. Hopper has invented a successful machine for doing this by steam power. In this apparatus the barrel stands on a platform arranged like an inverted steam hammer, and on turning on the steam it is brought, with a succession of blows, against a number of hinged stops, which closely encircle the barrel and on which the hoops strike. With one such machine the hoops of 2,000 barrels can be driven in ten hours by one man and two boys—an amount of work which formerly entailed the hand labor of ten men.

The barrels are filled from a rack provided with a series of pipes connected with a barrelling tank. Each pipe has at its exit end a float connected with a valve, which shuts off the oil when the barrel has been filled to within one gallon of its contents. The shives with which the barrels are closed are of wood and are put in with glue. A package which remains perfectly tight and free from leakage as long as it is handled carefully, and the continuous skin of glue remains intact, is thus produced.

As already stated, shipments heretofore made in barrels to many ports are now being made in bulk by both sailing vessels and steamers. These shipments and the vessels carrying them will be referred to later.

Cans and Cases.—Shipments of oil to warm climates are made exclusively in cans, as barrels, though cheaper per gallon, are liable to develop leaks when exposed to decided changes in temperature. Deliveries to the more distant ports of China, Japan, India, Australia, the East Indies and South America are still, and probably will for many years continue to be, made in these packages, as bulk vessels cannot afford to engage in that trade because no return cargoes can be secured, so that the whole expense of the round trip would have to be borne by the load of oil carried out, the steamer returning empty. Cases can be packed close together, making a solid mass, with no loss of space in a ship's hold. In this respect they have a decided advantage over barrels.

The cans are of rectangular form, holding five American (or four English imperial) gallons, and are put by twos into wooden rectangular boxes. The outside dimensions of a case are about 20¾ inches long by 15 inches high and 10½ inches wide. This makes a very convenient package for handling, the weight of the case with the cans full of oil being about 80 pounds. The manufacture of the can and of the case are distinct industries, the former requiring delicate and expensive machinery and a large force of skilled mechanics. Most of the raw material used in making the cans, including the tin plate, is imported from England, the major part of the heavy duty imposed being returned as drawback by the government when the package of oil is exported. This is also true of the case, much of the lumber used coming from Canada, a duty being paid when it is brought into this country, and returned on such portion of the lumber as is made up into the case and shipped abroad. Each can is fitted with a handle of wire or tin and a screw top from which the oil may be poured when the consumer wishes to use it. An oil case with its two cans is a package that reflects great credit on the skill of American inventors.

Shipments in Bulk.—A considerable portion of our domestic trade in refined oil and some portion of the trade in lubricating oils has, for many years, been done in bulk. By this we mean that no package is used for the product as it passes from the refinery to the consumer. Its course is somewhat as follows: When finished at the refinery it is pumped into large storage tanks. From these it is delivered in bulk to barges or tank cars. These carry it to the stations where it is pumped again in bulk to the dealers' tanks, to be by them delivered to the customer, or, in some cases, direct from the tank wagon to the consumer.

But this mode of transportation for export trade is of recent growth. When it was suggested that there were economies to be secured by carrying oil abroad in bulk, that all of the weight transported would be oil, and freighting the package would be saved, not to mention the expense of bringing back the empty barrel to be used again, which was largely practiced, as the barrels had become a burden to the foreign buyer, the contents being consumed and the packages left on his hands, numerous objections were presented. Some of them were, the great cost of providing vessels for the purpose, the small earnings on the investment because the return voyage must be made without cargo, the danger attending the enterprise from fire, and from loss of both vessel and cargo by foundering, and the damage to the oil by changing its test or color through the extra handling.

The change in the mode of transportation when it had once begun was carried forward with startling rapidity. The "Vaderland" was not a success as a tank steamer. In 1886 two others were fitted up, the "Crusader" and the "Andromeda." The former was filled with a large number (45 in all) of cylinder tanks of different sizes, averaging in capacity 125 barrels, making the total capacity of the ship about 275,000 gallons. The "Andromeda" was provided with rectangular tanks, 72 in number, making the total capacity about 685,000 gallons. Neither of the steamers made many voyages.

But when the thought was once fairly presented, it soon became apparent that mechanical construc-

tion only stood in the way of making the change. Sailing vessels carried from 5,000 to 8,000 barrels each, and made about two and one-half to three trips per year; bulk steamers could be built to carry 20,000 to 30,000 barrels, or three times as much as a sailing vessel, and make seven to nine trips per year, or three times as many as a sailing vessel. The result has been that last year as many as fifty-nine different tank steamers carried oil from the United States abroad, and fully 76 per cent. of the total exports of crude and refined oil, other than those in cases, were made in bulk.

Some of these steamers are "converted," that is, turned into bulk boats, although built for other uses. They can generally be distinguished by having their boilers and engines amidships, instead of, as in the case of the vessels built for this trade, aft, for greater safety. But many of the tank steamers are constructed especially for this service. They are models of marine architecture. They are built entirely of iron, including the decks. When loaded the whole body of the vessel is filled with oil, the ship's structure forming the necessary receptacle, the liquid occupying all the space to the "skin" or iron of the sides and bottom. This is a great improvement over such form of construction as that of the "Crusader" and the "Andromeda," already referred to, decreasing the cost of transportation by increasing the carrying capacity of the vessel, there being no unoccupied space between the tanks, and decreasing the risk of fires and explosions, as these empty spaces gave room for the accumulation of gas. Both these objections held true against the style of construction adopted later of a double bottom, the bottom of the oil tanks being elevated a short distance above the actual bottom of the ship. The tank ships as now built have a longitudinal and numerous transverse bulkheads, which, with the stringers and beams put in to prevent the slightest straining, make them, from a structural point of view ,undoubtedly the safest and strongest vessels in the mercantile marine. Here is given a clear and comprehensive description of one of the more recently built steamers, the "Charlois":

This vessel is 310 feet long, 39 feet beam and 25 feet 3 inches deep, and is capable of carrying upwards of 3,500 tons of petroleum, besides bunker coal, on a moderate draft.

The requisite subdivision into eight tanks of moderate size is obtained by the introduction of nine thwartship bulkheads, which are very heavily stiffened and made extra thick to withstand the pressure due to any one tank being full while the others are empty. In addition to these there is a longitudinal bulkhead running the entire length of the oil compartments in the center of the ship, which further subdivides each tank into two. Wells, or water spaces, are formed at each end of the oil compartments, which are filled with water when the vessel is loaded with oil, and thereby isolate the oil from the rest of the ship and boiler room, to prevent risk of fire. Each tank is provided with a smaller tank above, running up through the 'tween-decks to the upper deck, which is fitted to allow for the expansion and contraction of the oil, due to difference in temperature, without permitting the oil to ever fall below the level of the top of the tank proper, which is essential to the vessel's stability at sea. It is usual to carry these expansion tanks about half full of oil. The expansion tanks also serve the purpose of giving access to the tanks, proper manholes and Jacob's ladders being provided. A special feature in this vessel, which the designers had particularly in view, is the fact that she could, with very slight alterations, be used for ordinary cargoes; the expansion tanks being arranged conveniently, and of extra size, for this purpose; this is, we think, an important point. The machinery and boilers are placed close aft, and clear of the oil compartments, and the saloon and officers' and engineers' cabins and gallery are abaft this, and therefore well clear of the tanks. The crew are berthed in the forecastle, and there is a long bridge amidships, with a shade or awning deck, connecting it to the poop. The shade deck was specially introduced by the designers to make the vessel more seaworthy, as she is employed in the Atlantic trade, and this considerably reduces the amount of exposed deck. The internal fittings of this vessel are most complete, and, as a further precaution against fire, she is lighted throughout by electric light on the incandescent principle, the engines and dynamos being placed in the engine room directly under the control of the engineers. There are also steam heaters for all the cabins and the crew. Two powerful pumps are fitted in the 'tween-decks with very complete piping arrangements, each pump being capable of discharging the entire cargo of oil in thirty hours. As pointed out, there is no double bottom for water ballast, but tanks are provided at both ends for trimming purposes. For ballasting the ship when light, two or more of the oil tanks are run up with water, special means being provided for this purpose, and when so laden the vessel is much steadier at sea than if carrying ballast in the ordinary double bottom; and, as these vessels have to make one out of every two trips across the Atlantic, light ship, this is very important.

Experience has suggested some minor improvements since the "Charlois" was built. The vessels constructed later have somewhat greater carrying capacity. The expansion tanks are not so large, but extend the whole length of the oil tanks they are designed to relieve. The strength of the hull has been still further increased by the addition of another deck or horizontal partition running through the oil tanks, dividing each into an upper and lower tank. This iron partition, with its braces, adds materially to the stability of the ship both when empty and full.

The change from barrel to bulk transportation means large economies in many ways. Before it was made, oil was filled into barrels, each package weighed by itself, then rolled to the dock front and hoisted up over the side of the ship, lowered into the hold and stowed away. Each operation required considerable manual labor. The sailing vessel, for a month or six weeks, was then exposed to the de-



CAR LOAD OF NEW OIL BARRELS

(Ready to Ship from the A. Knabb & Co., Barrel Factory), Warren, Pa.

lays and vicissitudes of an ocean voyage, arriving at length at its destined port. Here she was unloaded, a barrel at a time, and the oil stored away in packages to be held until used, subject to loss from leakage and serious damage in appearance. By the new method of transportation, a steamer comes to the wharf and the oil is pumped from the refinery storage into her tanks with great rapidity; the largest of the ships being loaded in from ten to twelve hours even though they hold four or five times as much as the sailing vessels of a few years ago. A voyage of two weeks and perhaps a few days, the time being subject to very close calculation, brings the cargo to the foreign port. Here it is unloaded with the same dispatch that was used in loading; the oil being pumped into large storage tanks on shore, in which it is held without loss or damage until needed; the steamer starting immediately on her return trip. Not a moment of time is lost and no item of extra expense incurred.

LAUNCHING OF THE PENNOIL TANK STEAMER, OWNED BY PURE OIL CO., AT GREENOCK, SCOTLAND, NOVEMBER 18, 1902.

The Pennoil is a sister tank steamer to the ill-fated Pureoil. Built for the carriage of petroleum in bulk, the Pennoil is 385 feet long, 50 feet in beam, 30 feet deep (moulded) and at her summer Plimsoll mark carries close to 7,000 tons. She has been built to take the highest class in both British and German Lloyd's registers, and embodies all the latest experience of oil carrying vessels. A special feature in the design is that, unlike the majority of tank vessels, her machinery is placed amidships, which, it is expected, will obviate the undue straining to which tank vessels of large size with machinery in the after end are subjected in a seaway. The range of oil holds is divided into two spaces—one forward and one aft of the machinery space, and further subdivided and fenced off by means of cofferdams and divisional bulkheads. The total number of tanks is 22, each completely and hermetically isolated, and tested by a pressure of over 40 feet of water, necessitating a structure of very great strength and rigidity, combined with excellence of workmanship in detail. The range of tanks aft of the machinery is traversed by the tunnel, a huge circular tube admitting of access for examination of the shafting, and which is built on a system patented by the builders. A pump room is fitted at each end of the vessel, with one of the largest size of Snow pumps installed in each room, in connection with a system of pipes and valves by means of which the control of the entire operation of taking in or discharging a cargo of oil (or water ballast) can be performed, acting separately, or by the two pumps in conjunction. In the pump rooms are also placed the powerful steam fans, which are for the purpose of exhausting from the tanks the heavy and dangerous vapors which remain there after discharging their contents.

"The vessel has a forcastle, bridge, and poop, connected the one with the other by a fore and aft bridge, for use in heavy weather, and in these are provided on a most comfortable scale quarters respectively for crew, petty officers, captain, officers, and engineers. There are also provided wash rooms, workshop, and refrigerating chambers. A complete installation of electrical light is fitted by Messrs. McEwan, Clark & Co., of Edinburg and Glasgow, and with the object of preventing risk of fire, the ship is heated throughout the living quarters by steam. A system of overhead trolly railways has been provided for conveying of coal with minimum of labor to the stokhole from any part of the extensive range of bunkers, which aggregate a total capacity of 1,500 tons. Besides the compartments, which can be used for water ballast, a double bottom is provided under the machinery and large trimming ballast tanks at the extreme end of the vessel. Powerful steam windlass, winches, and steering gear are fitted. The propelling machinery, designed for a speed of 11 knots, and consisting of a set of triple expansion engines having cylinders 26 inches and 74 inches by 48 inch stroke, and three large single-stroke boilers, for a working pressure of 180 pounds, has been supplied by Messrs David Rowan & Co., Glasgow, Scotland.

BULK BARGES.

There are several bulk steamers, smaller, of course, than the ocean steamers, engaged in our coastwise domestic trade. But before either the ocean or coastwise steamers were put into service, many bulk barges were employed moving refined oil and naphtha about the seaboard harbors. This mode of transportation has grown in favor, and to-day, there is a large fleet of such barges, with their attendant steam tugs to furnish motive power, employed not only in harbors, but in the carrying trade for considerable distances along the coast and up the larger rivers. The barges are of wood or iron, some large enough to hold 500,000 gallons, the whole space of the hull being divided into tanks for the oil. Simpler in construction than bulk ocean steamers, they make it possible to move large quantities of oil with dispatch and economy.

Tank Cars.—The value of this mode of transportation became apparent in the early days of the petroleum industry; but in their construction, as in other branches of the business, there has been an evolution. The first cars consisted of two wooden tubs or vats of 2,000 gallons capacity each, set on an ordinary platform car. In 1872, horizontal cylinder tanks of iron were tried. Each held about 4,000 gallons. The size has gradually been increased by lengthening the cylinder and increasing its diameter until now many of the cars carry 8,000 gallons each. Cars holding this quantity are about thirty-two feet in length and six feet in diameter. The tank is made of quarter-inch steel and has on the top a dome, similar to a still dome, to care for the expansion of the oil. In the bottom of the car is an outlet valve with proper contrivances to admit of connecting lines through which to empty the tank. The total number of tank cars employed in the United States is between nine and ten thousand.

Tank Wagons.—The delivery of oil by tank wagons is extending the idea of bulk transportation to its farthest limits. The wisdom of carrying in this way the huge quantities, which a steamer or a train of tank cars convey for considerable distances, may be apparent; when the advantages of moving the smaller quantity which a tank wagon will hold, for the short trip it can make, may not be clear. That there must be economy or other advantages in this method of transportation is indicated by the strong foothold it has gained, as it is quite generally adopted in our larger cities and towns.

A tank wagon consists of a horizontal cylinder of steel of about three and one-half feet in diameter, and eight feet in length, mounted on four wheels similar to those used on heavy trucks. The capacity varies from 250 to 1,000 gallons; the large sizes being used in cities having paved, level streets; the smaller sizes, in the hilly outlying districts, or in sections where the trade is limited. A few of the larger wagons are rigged for three horses. Each tank has some sort of a manhole on top, for the admission of the oil, and some one of the various designs of outlet cocks and measuring devices, for drawing out the oil. These, with the receptacle in the cans for carrying the oil into stores, the driver's seat, and, in fact, all of the minor features of the plan of the wagons, differ in different cities. In some places the wagons leave the oil at customers' houses, but usually are employed to supply the stores in which oil is sold.

RULES GOVERNING EXPORTS OF CRUDE PETROLEUM.

The rules governing transactions in this branch of the business are those of the New York Produce Exchange, contracts for shipments from Philadelphia as well as New York being made subject to them. We give below the rules that apply to crude petroleum —

"Crude petroleum shall be understood to be pure natural oil, neither steamed nor treated, free from water, sediment, or any adulteration, of the gravity of 43 degrees to 48 degrees Beaume.

"When crude petroleum is sold in bulk, the quantity shall be ascertained by tank measurement, at the time of delivery.

"Crude petroleum in barrels shall be sold by weight, at the rate of six and one-half pounds net to the gallon.

"In the absence of any stipulation, crude petroleum, when sold in barrels, shall be unlerstood to mean, so far as regards packages, such packages as were originally refined petroleum barrels, whose last contents was crude petroleum, refined petroleum or naphtha.

"When contracts for crude petroleum call for second-hand refined petroleum barrels (i. e., barrels whose last contents has been refined petroleum or naphtha) the sellers shall have the privilege of substituting new barrels, but they shall be glued.

"The weighing and verification of crude petroleum shall be governed by the rules applicable thereto under the head of refined petroleum."

Rules Regulating Exports of Petroleum.—Contracts for the sale of petroleum for export are made subject to the rules of the New York Produce Exchange. This is true of deliveries to be made from Philadelphia and Baltimore as well as from the port of New York. We append these rules as now in force.

"Refined petroleum shall be Standard White or better, with a burning test of 110° Fahrenheit or upward, and of a specific gravity not below 44° Baume, United States Dispensatory Standard.

"The burning test of refined petroleum shall be determined by the use of the Saybolt Electric Instrument, and shall be operated in arriving at a result as follows: In 110° and upwards, the flashing points, after the first flash (which will generally occur between 90° and 95°), shall be taken at 95°, 100°, 104°, 108°, 110°, 112° and 115°.

"In 120° and upwards, after first flash, at 110°, 105°, 110°, 115°, 118°, 120°, 122° and 125°.

"In 130° and upwards, every five degrees until burning point is reached.

"When refined petroleum is sold in bulk, the quantity shall be ascertained by measurement on the decks of tank boats.

"Refined petroleum shall be delivered in blue, well-painted barrels, with white heads. Barrels shall be well glued and filled within one or two inches of the bung.

"Refined petroleum in barrels shall be sold by weight, at the rate of six and one-half pounds net to the gallon.

"The tares of refined petroleum in barrels shall be weighed by half pounds and gross weight by pounds.

"The gross weight of packages for refined petroleum shall be not less than 360 lbs., nor more than 415 lbs., and the actual gross weight shall be plainly marked thereon.

"Barrels shall be made of well-seasoned white oak timber, and shall be hooped not lighter than as follows: Either with six iron hoops, the headhoop 1¾ inches wide, No. 16 gauge English standard, the quarter hoop 1½ inches wide, No. 17 gauge, and the bilge hoop 1¾ inches wide, No. 16 gauge; or, with eight iron hoops, the head hoop 1¾ inches wide, No. 17 gauge, the collar hoop 1¼ inches wide, No. 17 gauge, the quarter hoop 1½ inches wide, No. 18 gauge, and the bilge hoop 1½ inches wide, No. 18 gauge. But all old barrels of which the gross weight is less than 395 lbs. may be hooped with six iron hoops 1½ inches wide, excepting the chime hoop, which shall be 1¾ inches wide.

"Buyers may test, at their own expense, the correctness of the gross weight, or gauge of the whole, or part of any lot delivered, and the average shortage found on a portion of not less than ten per cent. shall be taken as the average amount to be deducted from the lot.

"The tare shall be plainly marked upon each barrel before it is filled. Buyers may test the accuracy of the tare so marked to the extent of five per cent. of the lot, and the average difference between the tare thus ascertained, and the marked tare on the barrels tested shall be accepted as the average

difference on the entire lot. Any excess of tare so discovered shall be allowed buyer.

"Naphtha.—Naphtha shall be water white and sweet and of gravity of from 68° to 73° Baume.

"When naphtha is sold in bulk the quantity shall be ascertained by measurement on the decks of the tank boats.

"Naphtha in barrels shall be sold by weight, at the rate of five and three-quarter pounds net to the gallon.

"Barrels containing naphtha shall be painted blue with white heads, and be well glued.

"Naphtha shall be weighed, and may be tested by the buyer, as provided in the foregoing rules relating to refined petroleum.

"Residuum.—Residuum shall be understood to be the refuse from the distillation of crude petroleum, free from coke and water, and from any foreign impurities, and of gravity from 16° to 20° Baume.

"Residuum, when sold in barrels, shall be sold by weight at the rate of seven and one-half pounds net per gallon.

"Residuum shall be weighed, and may be tested by the buyer, as provided in the foregoing rules relating to refined petroleum.

"Empty Barrels.—Unless otherwise stipulated, empty barrels shall be understood to have last contained either refined petroleum or naphtha.

"Barrels shall be classified according to the use for which they are fitted, as follows:

"First-class shall include all barrels, which, if properly coopered, would be fit to carry refined petroleum or naphtha.

"Second-class shall include barrels which are unfit for refined petroleum or naphtha, but which would, if properly coopered, be fit for crude petroleum.

"Third-class shall include such barrels as are unfit for either crude, refined petroleum, or naphtha, but which can be used for residuum, if properly coopered.

"When barrels, which would otherwise be first-class, have been injured by sand, mould or water, they shall be placed in the second class.

"When barrels are sold as they run, the term 'as they run' shall be understood to refer to the condition as to the cooperage only.

"When barrels have been filled with crude petroleum, and steamed out after shipment to Europe, and used for refined oil, such packages shall be placed in the second class.

"All empty barrels must have six hoops, and be delivered in form, shooks or staves not being a good delivery.

"On re-inspection of rejected barrels, the buyer must receive the pay for such rejections as of the class designated by the inspector, and pay inspection on such as he decides were improperly rejected.

"Contracts and Deliveries.—All deliveries and contracts for delivery of petroleum and its products, under these rules, shall be of the production of the United States, unless otherwise specified, but refined petroleum made from crude oil of the district known as 'Lima' or oil made from crude oil of a similar quality or character, shall be excluded.

"All settlements of contracts for refined petroleum and naphtha shall be on the following basis: In barrels on 50 gallons; in bulk on 45 gallons. All settlements of contracts for crude petroleum shall be on the following basis: In barrels on 48 gallons; in bulk on 42 gallons.

"All cooperage shall be in prime shipping order. Tar and pitch barrels shall be excluded, except for residuum.

"Deliveries of petroleum and its products, sold in bulk, shall be made in yard, at refinery, or warehouse, free of expense to lighter, quality to be approved in the tank at the time of delivery.

"Deliveries of petroleum and its products, in barrels, shall be made in yard, at refinery, or warehouse, where sea-going vessels can load, or, if not, sellers to pay lighterage to vessel.

"The words, 'yard where sea-going vessels can load,' shall be understood to mean a yard at which vessels of at least 4,500 barrels capacity can complete loading.

"The presentation of an invoice, weigher's or gauger's return, a certificate of inspection of the oil, together with an accepted order on the warehouse, yard or refinery, shall constitute a delivery.

"No weigher's or gauger's return or certificate of inspection dated more than four secular days previous to the time of delivery shall be valid, and the said returns shall be verified on oath or affirmation when required.

"Petroleum and its products shall be held for three days from noon of the date of delivery order, free of storage and insurance. The party issuing the delivery order shall keep the goods covered by insurance during the three days; it being understood, however, that the responsibility of the said party shall only extend to due care in providing insurance, and not to any failure on the part of the underwriters to pay losses which may be sustained.

"Cargo contracts shall specify dates between which the vessels shall be ready for cargo, and also number of lay days vessels will have to load, and the term 'suitable to vessel' is hereby declared to have no reference to the time when vessels shall be ready, but to imply that when ready sellers shall deliver and buyers receive in such quantities that the vessel may be loaded in the specified lay days.

"If a vessel is not ready to receive her cargo on or within specified dates, a written notice to the buyers from the sellers on or before the latest named date that they are prepared to deliver as per contract, shall be considered a delivery, so far as maintaining to the sellers all their rights in the contract, and the sellers may commence delivering any time thereafter on one day's notice, and may deliver until completed such approximate quantity per day as would serve to fill the vessel in the stipulated lay days.

"When goods are delivered to vessel by buyer's orders the acceptance of them by buyer's inspector shall be an acknowledgment that the goods are in accordance with the contract.

"When petroleum or its products are delivered to vessel by buyer's directions, the seller's risk shall

end upon delivering goods to the ship's tackle, and the seller may require evidence from the buyer that the goods are actually covered by insurance until paid for.

'When the capacity of the vessel exceeds or falls short of the amount specified in the contract, including the margin, then the specified amount shall be delivered. In determining the capacity of the vessel, barrels of fifty net gallons capacity in case of refined petroleum and naphtha, barrels of 48 net gallons capacity in case of crude petroleum, and barrels of 45 net gallons capacity in case of residuum, shall be the basis for settlement.

"On option contracts, when not otherwise stipulated, it shall be understood that ten days' notice shall be given, five of which shall be within the delivery time specified. When the 'flat' is used, it shall be understood to mean without notice.

"All deliveries shall be made before 5 o'clock P. M. Parties making original deliveries from warehouse or refinery, shall do so before 4 o'clock P. M.

"Each party to whom delivery is made on an option contract, and who intends to deliver the same out again on an option contract, shall note on the delivery order for memorandum attached thereto the time when received, and shall deliver the same out again within fifteen minutes. Parties having oil to receive, and which they intend to deliver out again on an option contract, but who are prevented from so doing by lack of time, shall make delivery by 10 A. M. of the next business day, and each party receiving on the extended delivery day shall note the time and deliver out as above specified. No delivery shall be allowed beyond 12 M. on the delivery day so extended. Parties holding delivery orders of memorandums over fifteen minutes, except for cause acceptable to the Committee on Petroleum, shall be liable to the party injured by such unjust detention to the extent of the damage.

"Payments for all deliveries made before 3 o'clock P. M., shall be in legal tenders or certified checks. Parties making deliveries after 3 P. M. cannot demand legal tenders or certified checks; such deliveries, however, will be good if made in conformity with rule, but without delivery order. Payments which are extended by reason of delivery after 3 P. M. shall be made as provided above before 12 M. of the next business day.

"When calls are made on option contracts, the original call shall be made by 10 o'clock in the morning, and parties on whom the call is made shall note on the call the time it was received; and if they recall on account of it, they shall do so within thirty minutes.

"When contracts mature on a Sunday or legal holiday, deliveries shall be made on the preceding business day.

"Contracts for the delivery of petroleum or its products may be assigned, and the assignee shall succeed to all the rights of the assignor.

"All assignees of such contracts shall be bound by the obligations of the original contracts.

"In case any party holding a contract for petroleum or its products shall become insolvent, then all such contracts held by such party shall become due immediately, and shall be settled by the parties in interest at the market price of the day when such insolvency occurs, for the deliveries stipulated in the contracts, less the customary brokerage. All assignments of contracts made in contemplation of, or after, insolvency, shall be void.

"Nothing contained in these rules shall be constrained to prevent either of the original contracting parties from making delivery to or claiming delivery from the other party to the contract, but such delivery shall in no way otherwise invalidate the rights of any assignee of such contract. In case, however, a contract has been assigned, and either of the original contracting parties shall become insolvent, the other party to the contract may, at any time before the maturity of the contract, demand a sufficient margin from the assignee to make the contract good at the market price of the day for the delivery stipulated in the contract, and the party calling the margin shall put up an equal amount. Both margins shall be deposited in such trust company as shall be agreed upon, and such margins shall be kept good. If the demand for margin under this rule be not complied with within twenty-four hours after said demand, it shall then or thereafter be at the option of the aforesaid party to the contract to cancel the same, and settlement shall be made at the market price of the day next following such demand, for the delivery stipulated in the contract, less the customary brokerage.

"INSPECTION."

"Buyers shall have the right of naming their inspector, but shall do so at least five days before the maturity of the contract, failing in which the sellers may employ, at buyer's expense, any regular petroleum inspector approved by the Committee on Petroleum, and his certificate that the oil is in conformity with the contract shall be accepted. On a contract for prompt delivery, or where no notice is required, buyers shall name their inspector when contract is executed, otherwise sellers may appoint the inspector at buyer's expense.

"It shall be the duty of the inspector to promptly inspect all goods entered, and in case of rejection, to notify the seller immediately, to the end that he may be able to fill the contract by replacing the rejected goods.

"In case of dispute between buyer's inspector and the seller, in consequence of the rejection of goods, the seller shall have the right to name an inspector, and if the two cannot agree they shall name a third inspector as umpire, and a majority of the three shall decide the case, and render it incumbent upon the umpire to give a certificate in the regular form, without reference to the dispute. Inspectors to whom such dispute is referred shall have held uninterrupted license from the New York Produce Exchange for at least two years.

"Inspectors shall have the right to require barrels to be filled with refined petroleum at least twelve hours before the goods are tendered for inspection.

GENERAL RULES.

The forms of contracts hereto annexed are hereby made part of these rules, and when not otherwise stipulated, it will be understood that negotiations are based upon them.

"Washed or fictitious, sales are positively forbidden.

"Any disputes arising on contracts for petroleum and its products to be delivered in Philadelphia or Baltimore shall be adjusted by these rules.

"All transactions in petroleum and its products among members of the New York Exchange shall be governed by the above rules, but nothing therein contained shall be construed as interfering in any way with the rights of members to make such special contracts or conditions as they may desire."

We give below the form of contract for sales of refined oil in bulk and in barrels, as showing the general form of all these contracts:

CONTRACT FOR REFINED OIL IN BULK.

NEW YORK, Feb. 1, 1905.

Sold for account of Mr. Samuel Barr,

To Mr. George Carr, 50,000 gallons of refined petroleum in bulk, color, to be standard white, or better, burning test 110 degrees Fahrenheit, or upward, at 5½ cents per gallon, cash on delivery. To be delivered in yard at Erie, Pa., option as to time of delivery during the next ten days.

Subject to the rules of the New York Produce Exchange.

Brokerage ½ of one per cent. by seller.

JOHN DOUGH,
Broker.

OPTION CONTRACT FOR REFINED OIL IN BARRELS.

NEW YORK, Jan. 26, 1905.

Sold for account of Mr. Hugh McIntire,

To Mr. Charles Jones, 1,000 barrels, 100 per cent., more or less, refined petroleum. Color to be standard white, or better. Burning test 110 degrees Fahrenheit, or upward, at 6 cents per gallon, cash on delivery, in yard suitable to vessel. Vessel to be ready not earlier than the first Wednesday of February, 1905, nor later than the first Saturday of February, 1905, with two days to load.

Subject to the rules of the New York Produce Exchange.

Brokerage ½ of one per cent. by seller.

PETER MONEYMAKER,
Broker.

It may be well to add that the 44° gravity, Baume, United States Dispensatory standard, mentioned in these rules, corresponds to .8045 real specific gravity. Reference is made to Standard White color. There are three grades of color recognized in export shipments—Standard White (straw color), Water White (colorless), and a shade of color intermediate between the two, called Prime White. One of the rules speaks of 110° fire test. This means an oil which does not ignite when raised to this temperature in a testing apparatus which we will describe later, and a spark of fire, by means either of a burning splinter of wood, a burning piece of string, a little lamp or gas jet, or electricity, is applied to it. When no other test is designated in a contract 110° test is implied. But many countries have their own laws to regulate the test of the oil that can be legally used, and these laws generally prescribe the means for ascertaining the test. For example, England has fixed a minimum limit in the flash at 73° Fahrenheit, on an instrument devised by the eminent chemist, Sir Frederick Abel, with the aid of Dr. W. Kellner, assistant chemist of the English War Department. The test is to be found in the manner carefully outlined by the law, to be explained more fully in our section on modes of testing. Germany has a different test, with a minimum of flash at 21° on the Celsius scale or centigrade division of the thermometer, corresponding practically to 70° Fahrenheit, their own instrument to be used. In preparing oil for shipment to any country an effort is always made to have it comply with the legal requirements in regard to test, the oil being examined according to the mode of testing prescribed by that country.

State Laws Regulating the Sale of Petroleum Products.—The Legislatures of nearly all the States of the Union have enacted some restrictions on the manufacture and sale of oils. These show a wide divergence as regards the mode of examination and the test prescribed. It is not our intention to review this confused condition of legislation. The law in our State is that of May 15, 1874 (P. L. 189). It is, perhaps, as simple and satisfactory as any. It fixes a fire test limit of not less than 110° Fahrenheit for any illuminating product, such fire test to be ascertained on the Tagliabue cup, or the instrument that may be used by the inspectors of export oil. We append a copy of the law:

PENNSLYVANIA STATE LAWS FOR PETROLEUM.

(P. L. 189, May 15, 1874).

1. No refined petroleum, kerosene, naphtha, benzole, gasoline, or any fluid, be they designated by whatsoever name, the fire-test of which shall be less than 110 degrees Fahrenheit, shall be sold or offered for sale as an illuminator for consumption, within the limits of the Commonwealth of Pennsylvania.

2. Said fire-test shall be determined by an inspector appointed under the provisions of this act, who shall use Tagliabue's or such other well-defined instrument as may be used by the inspectors of export oil, according to the following formula: Heat with alcohol small flame; when thermometer indicates ninety degrees remove lamp; at ninety-five try for a flash, with small bead of fire on end of string, held within a quarter of an inch of surface of oil; replace lamp and work oil up gradually from this point until the burning point is reached, removing lamp every four degrees, and allowing oil to run up three degrees

before replacing lamp, flashing oil each time, just before lamp is replaced, until result is attained.

3. The said inspector shall be appointed by the Courts of Common Pleas, one in each county in the commonwealth, wherein said burning oil or fluids as before mentioned, are manufactured: *Provided,* That in any county where there shall be more than one Court of Common Pleas, the said appointments shall be made by Court No. 1, in said counties, and in any county wherein is situated a city of more than three hundred thousand inhabitants, in such case in lieu of Court No. 1, the appointment of inspector shall be made by the Mayor of said city.

4. The said inspectors shall hold their office for the term of three years, unless sooner removed by the appointing power, for incompetency, or found guilty under the provisions of this act; vacancies in said office to be filled by the authority in which the appointing power is vested by this section. The said inspectors shall be authorized to appoint such clerks or deputies as they may find requisite for the carrying out of the duties specified under this act; the said clerks and deputies shall be paid out of the fees of the office, by the inspector of the county wherein the service is performed; all clerks and deputies are held answerable by this act, and subject to the same penalties for violating any of its provisions as are provided in this act for the punishment of the appointed inspectors. Each inspector, deputy or clerk, after receiving his appointment, and prior to entering upon the duties of the office for which he is appointed, shall file in the office of the prothonotary of the Court of Common Pleas, an oath or affirmation that he will well and truly perform the duties of his office and carry out the provisions of this act, and said inspectors shall also file a bond, with one or more approved securities, in style similar to that of the sheriff of the county, in the penal sum of ten thousand dollars, for the faithful performance of the duties of said inspector's office, as provided in this act. The said inspector is hereby empowered to receive and collect from the manufacturer or owner the sum of 20 cents per package for each package inspected in any lot under ten; ten cents per package for each package inspected, in any lot not more than fifty; seven cents per package for each package inspected, in any lot or all lots over fifty; and one dollar for each car of bulk refined oil; and in any case any person shall call upon said inspector to inspect one package of refined oil, he shall charge said person for each inspection fifty cents. The said inspector shall provide at his own cost; stencils for the purpose of branding packages, to read thus: "State of Pennsylvania, fire-test one hundred and ten degrees," with name of inspector: *Provided,* When oil so inspected shall stand higher test, the inspector shall designate such actual test by his brand.

5. The said inspector, or his clerks or deputies, shall and are hereby empowered to enter any place or building where oil or fluids, as before designated in this act, are manufactured, kept in store for sale or consumption, in this commonwealth, and in such counties where oil is sold and not manufactured, for which no inspector has been appointed, or in any other place within the limits of this State, wherein he has reason for believing that oil is being kept or sold contrary to the provisions of this act, for the purpose of carrying out the true intent and meaning of this act, any inspector shall have the privilege to re-inspect, and is hereby empowered to inspect any oil, as hereinbefore designated in Section First, which he may, by any reason believe to be under fire test, and if so found by him to be under fire test and falsely branded, he shall prosecute or cause to be prosecuted the offender, as herein authorized in Section Four of this act; no charge shall be made for re-inspection.

6. Any person violating any of the provisions of this act shall, upon conviction thereof, be deemed guilty of a misdemeanor, and shall be subject to a fine of not less than two hundred and fifty ($250) dollars, nor more than five hundred ($500) dollars, or imprisonment not less than one year, or both, at the discretion of the Court, one-half of said fine to go to the prosecutor and one-half to the school fund in the district where such misdemeanor may have been committed. Also, if any person shall sustain damage to his property or injury to his person, by reason of a violation of any of the provisions of this act by another person, the person guilty of said violation shall be held liable to the person injured for all damages sustained thereby.

7. All the oils or fluids subject to inspection under this act that may be found in the hands of those who sell in less quantities than one barrel, with a fraudulent brand or mark of inspection, or found to have been adulterated or not coming up to the fire test, as the mark of inspection would indicate, shall be subject to seizure by the said inspector, and the same shall, after ten days' public notice, be sold solely for redistillation, the proceeds of such sale, after deducting the necessary expenses of sale and seizure, shall one-half be given to the public school fund wherever the seizure was made, and one-half to the informer.

8. Any inspector or deputy appointed under this act, who shall violate any of its provisions, by neglecting to inspect upon request, or shall falsely brand any oil or fluid, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined not less than two hundred and fifty $250) dollars, nor more than one thousand $1,000) dollars, and be subject to imprisonment for not less than three months or more than one year, or both, subject to the discretion of the Court, one-half of the fine to go to the informer, and one-half to the school fund of the district wherein the offense was committed.

9. The packages containing oil manufactured for export shall be branded with a stencil by the manufacturer with the words "for export," all benzine, naphtha or any hydro-carbons, created in the manufacture of refined oil from crude petroleum, or otherwise manufactured, shall be inspected and branded "Benzine," and shall not be kept for sale or used in any way for giving light to be burned in lamps, and this act shall not be construed to prohibit their use in making gas to be conveyed through pipes to burners similar to gas in city gas works, to be used for the same purpose, and further the penalties for violating this section shall be the same as applied to the use of refined oil below legal test.

10. Nothing contained in this act shall be construed or held to apply in any manner, to any kind of oil or fluid manufactured for export from this State, or in transit from one State to another through the limits of this commonwealth.

11. Any person or persons who shall sell or cause to be sold any barrel or package, or who shall refill the same without first removing the brand of the inspector, shall be liable to a fine of three hundred dollars for every barrel or package sold or delivered or refilled, said fines shall be recoverable as other fines of like character are recoverable by law, and one-half shall go to the informer, and one-half to the school fund of the district in which the offense was committed.

MODES OF TESTING PETROLEUM PRODUCTS.

REFINED OIL—LUBRICATING OILS—PARAFFINE WAX.

Refined Oils.—In addition to an inspection for color, which is a simple examination by the eye, refined oils are subjected to two tests, one to ascertain their specific gravity and the other to determine their fire test. The lines of demarkation between oil and naphtha, the product from crude lighter than oil, on the one hand, and between oil and residuum, the product heavier than oil, on the other, is, as has been seen, a purely arbitrary one. It has also been seen that it is not practicable to make oil absolutely free from the volatile elements of the crude called naphtha, or the heavier elements that should be left in the still as residuum. The presence of too large a proportion of the former renders the oil unsafe for illuminating purposes, as these lighter hydro-carbons vaporize at temperatures so low that the lamp may become filled with gas and an explosion follows. The presence of too large a proportion of the heavier elements injures the illuminating properties of the oil by preventing it from burning freely. The specific gravity test aims to show the density of the oil, and so to indicate, in a general way, the quality of the heavier hydro-carbons it contains.

Gravity.—To make a test for gravity, a tall glass jar is filled with the oil and a combined hydrometer and thermometer is immersed in it. The hydrometer, which is graded according to the Baume scale, registers the gravity, and the thermometer indicates the temperature of the oil. Standards for gravity require the oil to be at 60° temperature when tested, but carefully prepared tables have been made for correcting the hydrometer reading to a 60° temperature basis, so that the gravity can be ascertained quickly with the oil at temperatures both above and below 60°. We give, among our statistics on petroleum products, a table showing the corresponding real specific gravity and the weight of one gallon of oil for each degree of the Baume hydrometer. In the absence of a table, however, Baume can be easily converted into real specific gravity, by dividing 140 by 130, plus the degree indicated on the Baume scale.

Flash and Fire Tests.—The test for gravity is of but little moment in comparison with that to ascertain the fire test of oil. Upon it the public have to depend for a guarantee that the product can be used for illuminating purposes with safety. Proper methods and sufficient care should be employed in manufacture to insure, in the finished product, the absence of the more volatile hydro-carbons, which are vaporized at low temperatures, and may form an inflammable atmosphere in the oil reservoir of lamps. According to the axiom of Dr. F. H. Chandler, of the Columbia College School of Mines, "No lamp is safe with dangerous oil and every lamp is safe with safe oil." This does not necessarily mean the establishment of a high test requirement that will be burdensome, both to the manufacturers by restricting their yield to too narrow limits, and, at the same time, to the consumers, it being a well known fact that, as the test is raised, oil proves less satisfactory as an illuminant, specially constructed lamps being required to make very high products burn at all. There is needed, simply, a test that will detect the presence of the easily volatilized elements, which unscrupulous refiners sometimes leave in their burning oil to cover up defects in manufacture. As low a fire test requirement as comes within the limit of safety, rigorously enforced, is all that is needed to accomplish this end.

While considering this topic of safety we cannot forbear to quote a paragraph from an article by Mr. Boverton Redwood, the secretary of the London Petroleum Association, and their inspector, who was the associate of Sir Frderick Abel in the most thorough investigation of the subject made in England before the adoption of the admirable law now in force. That the same conclusion has been reached by every scientific study of the question, is reassuring to the people of Pennsylvania, to whom the petroleum industry is so important:

"There are probably no grounds for supposing that petroleum oil constitutes a dangerous article in the ordinary stock of an oilman. On the contrary, there is a good deal of evidence in support of the opposite view. Thus, to take one instance only, in the case of one of the most recent fires at an oilman's shop almost the only portion of the contents of the shop which had escaped destruction were three barrels of petroleum oil, constituting, according to the evidence given, the whole stock of this material on the premises at the time of the fire. These barrels were a good deal charred, but still held a considerable quantity of oil. Petroleum is, in fact, a far less dangerous liquid than is commonly supposed, as was pointed out some years ago, and again last year, by Sir Frederick Abel in lectures at the Royal Institution. Statistics show that the destruction of petroleum-laden ships by fire is very rare, and at least one case is on record where a vessel carrying petroleum having been set on fire by lightning, the fire was extinguished and the cargo brought safely into port. Many barrels discharged from the vessel in question bore evidences of the heat to which they had been subjected, being in some cases so much charred that a penknife blade could be driven through the staves, and yet these barrels still held the oil intact."

When oil is heated, vapors are thrown off, and, being heavier than air, they do not rise far from the surface of the oil under test. On passing a light over this

surface, as the temperature of the oil is raised, there will first appear what the English Petroleum Act of 1862 describes as a "pale blue flicker or flash," caused by the vapor igniting and burning off from the surface of the oil. The temperature of the oil when this first occurs, is called its "flash test" or "flashing point." As the temperature rises still further, a point is reached at which the oil itself takes fire on the application of a lighted taper. This is called its "burning point" or "fire test." Ignition is always preceded by a flash, but the difference in temperature between the points of flash and burning varies according to the grade of oil and its mode of manufacture. It will be clear from this description that at neither of these temperatures would the oil ignite in spontaneous combustion, as a light is required to secure even the flash referred to. Spontaneous combustion will not take place until the oil has been heated to at least 300 degrees higher than the technical "burning point" prescribed by our State law. Testers soon found that the flash and burning points were affected by the manner in which the oil was heated, by the size of the light applied to the surface, and by many other features of the test, if the details were left to the discretion of the operator. It was necessary either to outline with great minuteness every step in the test, or invent an instrument that would do the work mechanically, and, therefore, always uniformly. Modern testing cups aim to do this. The instruments have been improved, and modes of testing made more uniform. The old method of passing a burning splinter of wood or a bead of fire on the end of a string across the surface of the oil, has been supplanted by mechanical devices which carry the flame of a little lamp near to the oil, or by the use of an electric spark.

The apparatus adopted by the New York Produce Exchange is that known as the Saybolt Electric Tester, which has been in use since 1879. It is much like the Tagliabue cup; but uses an electric spark instead of a burning splinter of wood to communicate the fire to the vapor. A copper water bath, heated by a spirit lamp or gas jet, has set in its top a glass petroleum holder. A thermometer is held in place in the water bath, and another in the oil, while a clever device throws an electric spark across the surface of the oil whenever desired. The water bath is filled and heated to 100° Fahrenheit, and the lamp removed. The oil cup is filled to within one-eighth of an inch of its top, and placed in the bath. When the temperature of the oil reaches 90° an electric spark is sent across it. The lamp is then replaced under the water bath and the spark applied when the temperature of the oil is 95°, and again when it is 100°, 104°, 108°, 112°, and 115°, or until the oil flashes. The cup prescribed by our State law is the Tagliabue open cup, which is about the same as the Saybolt cup, except that a lighted taper, instead of an electric spark, is used—the objective point being that at which the oil itself ignites.

Undoubtedly the test most widely employed the world over is that of Sir Frederick Abel adopted by the English Parliament, August 11, 1879. The specifications of the apparatus as described minutely in the law are briefly as follows:

A cylindrical cup of gun metal or brass, tinned inside, 2 inches in diameter and 2.2 inches high, provided with a close-fitting, overlapping brass cover which carries the thermometer and test lamp, is suspended in a bath or heating vessel consisting of two flat-bottom copper cylinders—the inner one 3 inches in diameter and 2½ inches high, the outer one 5½ inches in diameter and 5¾ inches high—the smaller set inside of the larger, and the space between them filled with water. The oil cup, therefore, is surrounded by an air space of one-half inch, heated by a water bath; which, in turn, surrounds it. A copper cylinder or jacket, 6½ inches in diameter, surrounds the water bath. A thermometer is provided for the water bath and another for the oil. The light for testing is furnished by a little lamp, supported on the cover of the oil cup in such a way that, as a slide is removed—uncovering a square hole in the cover of the cup—it is tilted so as to bring the flame just below the cover, returning to its original position as the slide is moved back. Near the lamp is a little bead, the dimensions of which represent the size of the test flame to be used. Where gas is to be obtained the oil lamp is to be replaced by a gas flame; but the size of the flame, is still to be regulated by the standard bead. The temperature of the water bath is brought to 130°, and the lamp used for heating is withdrawn. The oil cup is then filled to within one-half inch of the top with oil at 60° temperature, and placed in position. When the oil reaches 66° the operation of testing is commenced; the test flame being applied once for every rise of one degree. This is done by slowly drawing open the slide—and closing during a fourth oscillation; the movement of the slide swinging the light of the testing lamp below the cover of the oil cup, as described above.

Lubricating Oils.—In addition to tests for gravity, flash and burning points—which are made in ways somewhat similar to the tests applied to the refined oil—lubricating oils are subjected to two other tests; to determine their "voscisity" and their "cold test." By the former it is claimed that the lubricating properties of the oil can be, to a large extent, determined. It shows its viscidity or glutinous quality. The test is made by noting the length of time occupied by a given quantity of the oil in flowing through a small orifice of prescribed dimensions and form, at a given temperature; the longer the time required the greater the viscosity.

By cold test is meant the temperature at which the oil thickens or becomes cloudy or ceases to flow because of the crystallization of the paraffine it contains. The test is usually made by slowly cooling the oil in a small tube, or long bottle about 5½ inches in length and 1½ inches in diameter, in which a thermometer is inserted to note the temperature at which the oil no longer flows when the bottle or tube is inclined, or the temperature at which deposition of paraffine commences.

Paraffine Wax.—This is subjected to two tests, one to ascertain the amount of oil left in it, and the other to determine its melting point. The former test is applied by noting the loss in weight of a given quantity of wax when subjected to a specified pressure for a

certain length of time. By melting point is meant the temperature at which the wax after being melted begins to solidify on cooling. A thermometer is inserted in the melted wax and used to gently agitate it until a film of the crystallizing point appears. The temperature is noted as the so-called melting point of the wax.

HISTORY OF THE INVENTION AND MANUFACTURE OF IRON PIPE.

William Smith, an iron moulder of Pittsburg, Pa., invented the first iron pipe ever made in the world, in 1843. Mr. Smith named his foundry the National Pipe Works.

The American Wrought Iron Oil and Natural Gas Line pipe, Tubing, Casing and Drive Pipe for oil and gas wells and transporting oil and natural gas are specially made of lap-welded wrought iron of selected material, tested to 2,000 pounds before leaving the mills, and are known in the trade as oil line pipes. The lengths are from 18 to 24 feet long, and are made in sizes as follows: 2, 2½, 3, 3½, 4, 4¼, 4⅞, 5, 5 3-16, 5¼, 5½, 5⅝, 6, 6 3-16, 6¼, 6½, 6⅞, 7, 7½, 7⅞, 8, 8¼, 8½, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 30 and 32 inches in diameter, and are fitted at one end with a coarse and sharp-cut taper thread, from 8 to 11 to the inch, while the other end is supplied with a collar called a socket, thimble or coupling.

Mr. William Childs, Jr., secured a United States patent in 1854 for the invention of making wrought iron pipe with welded seams.

The Boston Tube Works, of Boston, Mass., made the first butt and lap weld tubing, casing, drive pipe and line pipe for oil and gas wells.

The Beginning and Rise of the Standard Oil Co.

In the year of 1858 two young men, Morris B. Clark and John D. Rockefeller, of Cleveland, Ohio, started a small commission store on Merwin street, foot of Superior street, and the Cuyahoga river dock at Cleveland, Ohio. Their business was carried on in a very modest way and on a small scale until the year 1863, when a gentleman from Oil Creek, Pa., Samuel Andrews by name, and an oil refiner by profession, called at the commission house and induced Messrs. Clark and Rockefeller to organize a joint company to refine crude oil at Cleveland. Messrs. Clark and Rockefeller, as commission merchants, were handling refined oil, and this induced them to form a partnership in a small crude oil refinery, with Samuel Andrews. Their first refinery was built at the mouth of Kingsbury Run, Cuyahoga river, one mile from where it empties into Lake Erie, at Cleveland, Ohio, and was known as the Clark, Rockefeller & Andrews Crude Oil Refinery. The capacity of the first refinery when completed was found to be ten barrels of refined oil each day, and only one grade of oil was refined under the Andrews process from crude oil. Because of the fact that they only had one grade the firm gave it the name of Standard Oil 120° fire test. From time to time new tanks and stills were added to the little refinery, until the firm had over $100,000 invested in the refinery, and at the same time a number of other refineries were built or were building in and around Cleveland, and in 1865 Cleveland was the largest refining center in the world, with twenty refineries, with a capacity of 9,000 barrels of refined oil a day. This was the year the several refiners began cutting prices in refined oil to get a market for their product. At that date lamps were not universally used, and more oil was refined than was consumed. Clark and Rockefeller, as commission merchants, had a number of regular customers who bought a regular amount of refined oil each day, but as the other refiners were cutting on the price of refined oil, Clark and Rockefeller had to reduce the price on their oil to keep their customers. This discouraged Mr. Clark but Mr. Rockefeller had a different view of the matter, and he used to argue that if new markets could be opened up it would create a greater demand for the refined oil, and as an evidence of this belief he sold his interest in the commission business to Mr. Clark, and in return bought Mr. Clarks' interest in the refinery. The firm's name was then changed in the refinery to Rockefeller & Andrews. In the new firm Mr. Andrews attended to the refining, while Mr. Rockefeller attended to the buying and selling of the oil. From the beginning his effect on the business was tremendous. His motto was save and not waste. He owned his own teams and he himself went to the wells on Oil Creek and bought the oil and had his teams to haul the oil to the nearest railroad point, and then shipped it by rail to the refinery at Cleveland, Ohio. By this method he did away with the middle man and speculator. He made his own oil barrels, and painted them blue with white heads and black lettering. He found a regular market for their refined and heavy, or lubricating oil, and he found a use and sale for the residuum, or still tar that the other refiners burned up or let go to waste in the run. He watched the new improvements made in the refineries and the developments made on Oil Creek. John D. Rockefeller was a very shrewd buyer of crude oil, a great financier, an expert in selling their oils and ever ready to adopt new and better methods of handling the oil, and Mr. Andrews was recognized as the best refiner.

These qualities were the success of the firm, which grew rich, and started a second and larger refinery. They added a new member to the firm, Dr. William Rockefeller, a brother of John D. Rockefeller. The second refinery went under the firm name of William Rockefeller & Co. The firm, with two refineries, then took in a new partner in the person of Henry M. Flagler, who was assigned to the purchasing branch, which was known on Oil Creek in 1868 as Rockefeller, Andrews & Flagler Company, and in 1869 Henry M. Flagler was placed at the head of the company's house, which they were about to open in New York for the sale of their oils.

From 1868 to 1870 the competition and cutting in the price of refined oil was so great that there was little profit in oil after the freight was paid. At the same time the Pennsylvania Railroad Company, who believed they had a patent right over all the territory of the State of Pennsylvania for the passenger and freight carrying traffic, gave John D. Rockefeller and his associates a rebate on all the oil they shipped on their road. This was done to drive the Atlantic & Great Western (Erie) road and the Lake Shore & Michigan Southern railroad out of the oil regions of Pennsylvania, and in a short time the Pennsylvania and the Atlantic & Great Western (Erie) railroads gave John D. Rockefeller and his associates a large rebate for all their oil, crude and refined, to Cleveland, Ohio, Philadelphia, Pa., New York and other points, shipped by rail or water, by them. The Lake Shore & Michigan Southern Railroad was cut off from carrying oil for the Rockefeller interests, owing to the fact that they would not give as good a rebate as the Pennsylvania and Erie railroads.

Mr. Rockefeller and his partners had as much right to ask for rebates from the railroads carrying their oil as people have to ask for and expect excursion rates for

ten or more persons traveling to a certain point or place, or as much right as people marketing or shopping have the right to price goods and if not satisfied with the prices at one place to go elsewhere. This was the case with Mr. Rockefeller and his partners. If they could not secure the rebate from one railroad they would go to another, and agree to give the railroad a number of barrels of oil to haul to certain points each and every day at a fixed rate, with a return rebate. It was all right and proper for Mr. Rockefeller and his partners to ask for a rebate, but it was unlawful for the railroads to grant it. The railroads were granted charters as common carriers, and were not to discriminate between shippers in railroad carrying rates. Rockefeller, Andrews & Flagler got to be very large shippers of oil to the seaboard. The Lake Shore & Michigan Southern railroad officials asked for part of their traffic, but before this was done a meeting was held between John D. Rockefeller, representing Rockefeller, Andrews & Flagler, and William H. Vanderbilt, representing the Lake Shore & Michigan Southern (New York Central & Hudson River railroad). A shipping rate was agreed on at that time.

John D. Rockefeller was the president and adviser of all the concerns he was interested in, and on January 1, 1870, he combined all his companies into one, the Standard Oil Company, which was incorporated under the laws of the State of Ohio. January 10, 1870, with an authorized capital stock of $1,000,000. On February 10, 1872, the Standard's capital was increased to $2,500,000. The incorporators were John D. Rockefeller, Henry M. Flagler and Samuel Andrews, Stevenson V. Harkness and William Rockefeller. Through the agreement with the New York Central railroad and the Standard interests, the Pennsylvania and Atlantic & Great Western (Erie) railroads lost the Standard Oil Company's carrying traffic. This led Thomas A. Scott, vice president of the Pennsylvania Railroad Company, to suggest to John D. Rockefeller to purchase the South Improvement Company charter, and have the three leading railroads in the Oil Creek oil regions agree to a division of the traffic and raise the carrying rates to other shippers.

Following is a true and correct copy of the charter of the South Improvement Company:

CHARTER OF THE SOUTH IMPROVEMENT COMPANY.

An Act to incorporate the South Improvement Co.

Section 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same, That S. S. Moon, R. D. Barclay, John A. Fowler, or a majority of them, their associates, successors, and assigns, be, and they are hereby authorized and empowered to form and be a body corporate, to be known as the South Improvement Company, which shall be, and is hereby, vested with all the powers, privileges, duties, and obligations conferred upon the act to corporate the South Improvement Company, by the act of the Legislature of Pennsylvania, approved the 7th day of April A. D., 1870, and the supplement thereto, and by that name, style and title shall have perpetual succession and all the privileges, franchises and immunities incident to a corporation; may sue, and be sued, implead and be impleaded, complain and defend in all courts of law and equity, of record and otherwise; may purchase, receive, hold, and enjoy, to them, their successors, and assigns, all such lands, tenements, and leaseholds, estates and hereditaments, goods and chattels, securities and estates, real, personal and mixed, of what kind and quality soever, as may be necessary to erect depots, engine houses, tracks, shops, and other purposes of said corporation, as hereafter defined by the second section of this act, and the same from time to time may sell, convey, mortgage, encumber, charge, pledge, grant, lease, sublease, alien and dispose of, and also make and have a common seal, and the same to alter and renew at pleasure, and ordain, establish and put in execution such by-laws or ordinances, rules and regulations as may be necessary or convenient for the government of the said corporation, not being contrary to the constitution and laws of this commonwealth, and generally may do all and singular the matters and things which to them shall appertain to do for the well being of the said corporation and the management and ordering of the affairs and business of the same;

Provided, That nothing herein contained shall be so construed as to give to the said corporation any banking privileges or franchises or the privilege of issuing their obligations as money.

Section 2. That the corporation hereby created shall have power to contract with any person or persons, firms, corporations, or any other party, howsoever formed, existing, or that may hereafter exist, in any way that said parties, or any of them may have authority to do, to build, construct, maintain, or manage any work or works, public or private, which may tend or be designed to include, increase, facilitate, or develop trade, travel, or the transporation or conveyance of freight, live stock, passengers, or any trade traffic, by land or water, from or to any part of the United States or the Territories thereof; and the said company shall also have power and authority to supply or furnish all needful materials, labor, implements, instruments and fixtures of any and every kind whatsoever, on such terms and conditions as may be agreed upon between the parties, respectively, and also to purchase, erect, construct, maintain, or conduct, in its own name and for its own benefit, or otherwise, any such work, public or private, as they may by law be authorized to do (including also herein lines for telgraphic communication), and to aid, co-operate and unite with any company, person or firm in so doing.

Section 3. The company hereby created shall also have the power to make purchases and sales of or investments in the bonds and securities of other companies, and to make advances of money and of credit to other companies, and to aid in like manner contractors and manufacturers, and to receive and hold, on deposit or as collateral or otherwise, any estate or property, real or personal, including the notes, obligations and accounts of individuals and companies, and the same to purchase, collect, adjust, and settle, and also to pledge, sell, and dispose thereof on such terms as may be agreed on between them and the parties contracting with them; and also to indorse and guar-

antee the payment of the bonds and the performance of the obligations of other corporations, firms and individuals, and to assume, become responsible for, execute and carry out any contracts, leases, or subleases made by any company or companies, individuals or firms whatsoever.

Section 4. The company hereby created shall also have power to enter upon and occupy the lands of individuals or of companies on making payment therefor, or giving security according to law, for the purpose of erecting, constructing, maintaining, or managing any public work, such as is provided for or mentioned in the second section of this act, and to construct and erect such works thereon, and also such buildings, improvements, structures, roads, or fixtures as may be necessary or convenient for the purposes of said Company, under the powers herein granted; and to purchase make, use, and maintain any works of improvements connecting or intended to be connected with the works of the said company; and to merge or consolidate or unite with the said company the improvements, property and franchises of any other company or companies on such terms and conditions as the said company may agree upon; and to fix and regulate the tolls or charges to be charged or demanded for any freight, property or passengers traveling or passing over any merchandise or property transported over any road whatever by the said company, and to make, from time to time, dividends from the profits made by the said company; the several railroads managed by said company shall continue taxable, as heretofore, in proportion to their length within this State, respectively, and the said South Improvement Company shall be taxable only on the proportion of dividends on its capital stock and upon net earnings or income, only in proportion to the amount actually carried by it within the State of Pennsylvania, and on its earnings or income derived from its business beyond the limits of this commonwealth shall not be liable for taxation.

JAMES H. WEBB,
Speaker of the House of Representatives.
WILLIAM A. WALLACE,
Speaker of the Senate.
Approved the 6th day of May A. D., 1871.
JOHN W. GEARY,
Secretary.

This charter was secured and turned over to the South Improvement Company by Thomas A. Scott, vice president of the Pennsylvania Railroad Company.

The stockholders and signers to the agreement of the South Improvement Company, which was organized January 2, 1872, were: W. G. Warden, 475 shares; O. F. Waring, 475 shares; John D. Rockefeller, 180 shares; William Rockefeller, 180 shares; Henry M. Flagler, 180 shares; O. H. Payne, 180 shares; J. A. Bostwick, 180 shares; P. H. Watson, 100 shares; Richard S. Waring, 10 shares; Charles Lockhart, 10 shares; John P. Logan, 10 shares; W. P. Logan, 10 shares; William Frew, 10 shares. P. H. Watson was elected president and W. G. Warden, secretary.

The signers to the railroad carrying rates and rebates were William H. Vanderbilt, vice president of the Lake Shore & Michigan Southern Railroad, and the New York Central and Hudson River Railroad; Jay Gould, president of the Atlantic and Great Western and Erie Railroads; Thomas A. Scott, vice president of the Pennsylvania Railroad System; Robert A. Garrett, president of the Baltimore & Ohio Railroad System.

The agreement was as follows:

The South Improvement Company, party of the first part, agrees to ship 45 per cent. of all oil transported by it over the Pennsylvania Railroad; 30 per cent. of all oil transported by it over the Atlantic & Great Western (Erie) Railroad, and 25 per cent. of all oil transported by it over the Lake Shore & Michigan Southern (New York Central and Hudson River Railroad), and further agrees to ship all oil transported by it in the Baltimore & Ohio territory over the Baltimore & Ohio Railroad. The South Improvement Company also agrees to furnish suitable tankage facilities for shipping petroleum and receiving it at its destination, and to keep records of the amount of petroleum and its products shipped over the railroads concerned, both by itself and other parties, and the Lake Short & Michigan Southern and New York Central and Hudson River and all branches operated under the said New York Central System.

The Atlantic & Great Western and Erie, and all connecting railroads operated by the Erie Railroad System; the Pennsylvania and all connecting railroads operated by the Pennsylvania Railroad System; the Baltimore & Ohio and all connecting railroads operated by the Baltimore & Ohio Railroad System, parties of the second part, agree to allow parties of the first part rebates on all petroleum and its products carried by them, and to charge all other parties not less than the full rates specified in this contract and agreement. The railroads also agree to furnish to the South Improvement Company manifesto and way bills of all petroleum or its products transported over their lines by all parties whatever; also all the railroads and water navigation companies, parties of the second part of this agreement, shall at all times co-operate, as far as they legally may, with the party hereto of the first part, to maintain the business of the party hereto of the first part agaist loss or injury by competition, and to that end shall lower or raise the gross rates of transportation over its railroads and water navigation connections as far as it legally may, for such times and such extent as may be necessary to overcome such competition.

The following is a list of some of the gross rates and rebates provided for in the contract:

RATES AND REBATES ACCORDING TO CONTRACT.

ON CRUDE PETROLEUM.

From any common point to:—	Gross Rate.	Rebate.
Cleveland, Ohio	$ .80	$ .40
Pittsburg, Pa.	.80	.40
New York, N. Y.	2.56	1.06
Philadelphia, Pa.	2.41	1.06
Baltimore, Md.	2.41	1.06
Boston, Mass.	2.71	1.06

ON REFINED PRODUCTS AND BY-PRODUCTS.

From Pittsburg, Pa., to:—	Gross Rate.	Rebate.
New York, N. Y.	$2.00	$ .50
Philadelphia, Pa.	1.85	.50
Baltimore, Md.	1.85	.50
From Cleveland, Ohio, to:—		
Boston, Mass.	2.15	.50
New York, N. Y.	2.00	.50
Philadelphia, Pa.	1.85	.50
Baltimore, Md.	1.85	.50

For each barrel of 45 gallons.

The contract of agreement was formally signed, sealed and delivered to the South Improvement Company, January 18, 1872, and the increase of freight went into effect February 26th, 1872 and February 27th, 1872.

A mass meeting of the oil producers was called, and on Monday, March 15th, 1872, by the influence of the producers, a resolution was introduced into the House of Representatives by Representative Glenn I. Schofield, of Warren, Pa., ordering an investigation of the South Improvement Company. Immediately the frightened participants cancelled the contract of agreement. By the 26th of March the representatives of the people had secured a pledge in writing from the five great railroads concerned of perfect equality and no rebates, drawbacks or other arrangements in favor of any one thereafter.

March 30th, 1872, Congress began the investigation, which brought to light the fact that the incorporators of the South Improvement Company were employes of the Pennsylvania Railroad Company, at Philadelphia, Pa., when not "lobbying" at Harrisburg, Pa., for the Pennsylvania Railroad Company. The committee also brought to light the evidence of the contracts, and meanwhile the Committee on Legislation and Pipe Lines was securing from the Legislature of Pennsylvania the repeal of the South Improvement Company's charter, and the passage of a so-called Free Pipe Line Law. The railroads in the South Improvement Company agreement feared the destruction of the railroads' property. Gen. George McClellan, of the Atlantic & Great Western, telegraphed the members of the Legislature of Pennsylvania and the oil producers that the contract with the South Improvement Company was "cancelled." President Clark, of the Lake Shore & Michigan Southern Railroad, telegraphed the Legislature and wrote an open letter to the oil producers that the agreement with the South Improvement Company was formally abrogated and cancelled.

Chairman Homer Ramsdell, of the Erie Railroad, in an open letter, declared the contract with the South Improvement Company was abrogated.

Vice President Thomas A. Scott, of the Pennsylvania Railroad, announced that the contract with the South Improvement Company was terminated officially.

William H. Vanderbilt, vice president of the New York Central and Hudson River Railroad, in an open letter, stated the contract with the South Improvement Company was cancelled with all the railroads March 20th, 1872. This was six days before the repeal of the South Improvement Company's charter.

After the repeal of the South Improvement Company's charter the oil trade was transferred to the Standard Oil Company, and at this stage a few of the ablest business men the world has ever seen realized the importance of the oil industry, and invested largely in the purchase of property connected with it. The success of the oil business was phenomenal, and so was the success of the Standard Oil people. The profits they made, and as much capital as they could borrow, and new stock they issued, were fearlessly re-invested, and they soon became the largest owners of oil refineries and pipe lines in the oil business and in later years entered the oil territory as producers of oil, and soon became the principal owners of the territory which contains the great source of wealth. The Standard Oil Company would long ago have gone to pieces had it not been managed upon the whole in harmony with the law of supply and demand, and have employed the most skilled labor and have always given their employes the highest salaries and wages, and accorded them the most civil treatment. The Standard Oil Company has never had a labor dispute or strike with its employes in the oil regions.

It is generally admitted that the price of oils, both refined and lubricating, to the consumers are as low to-day as the supply and demand of the world will permit. The greatest competition the American oil has to-day is that which is produced in Russia, Japan, East India and Sumatra, and to meet this competition the American refiners have oil refineries and oil stations at or near all the important foreign seaports.

All of the successful oil and natural gas operators and oil refiners, Standard or independent, are self-made men. Not one could be said to have been rich at the start.

After the South Improvement Company's charter was repealed, the Congressional Committee decided its labors were done, and the investigation ceased.

The Standard Oil Company, from time to time, acquired by purchase or consolidation pipe lines and refineries. In 1874 the Parkersburg, W. Va., Refinery, under the management of J. N. Camden, became part of the Standard Oil Company, and through Mr. Camden's influence with Robert A. Garrett, president of the Baltimore & Ohio Railroad, they received special rates on all oil and material shipped and received by them over the Baltimore & Ohio Railroad.

The Pennsylvania Railroad Company continued to give the rebate to the Standard Oil Company after the

repeal of the South Improvement Company charter, and on March 13th, 1875, the capital of the Standard Oil Company was increased to $3,500,000.

In May, 1877, the directors of the Pennsylvania Railroad Company instructed its president, Thomas A. Scott, to no longer discriminate between their customers, but to treat all alike. In due time the Standard Oil Company received notice from the Pennsylvania Railroad Company that their shipping rates would be equal to all other shippers. This was the cause of the Standard Oil Company turning all of its shipping over to the other three trunk lines, the Baltimore & Ohio, New York Central and Erie Railroads. At the same time the Pennsylvania Railroad Company was operating the Empire Pipe Line. This was the cause of the railroad war between the Pennsylvania Railroad and the Standard Oil Company, backed up by the Baltimore & Ohio, New York Central and the Erie Railroads. The three roads cut the rates to the Standard Oil Company to 10 cents a barrel on oil to the seaboard. The three roads fought the fight of the Standard Oil Company against the Pennsylvania Railroad. They bore all the expense of the fight. While the Standard Oil Company was waiting and reaping the benefits the railroads were cutting the rates for the benefit of the Standard Oil Company. At this time the Pennsylvania Railroad became pressed for money for operating expenses, and were forced to sell the Empire Pipe Line to the Standard Oil Company. This rate cutting led up to the great railroad strike which began July 16th, 1877, on the Baltimore & Ohio Railroad, at Martinsburg, W. Va., and in two weeks tied up the Pennsylvania, Erie, New York Central, Lake Shore and Michigan Southern and all Western Railroads.

The feelings of the railroad employes all over the country was expressed by the address of those of the Pennsylvania Railroad to its stockholders: "The stockholders were reminded that many of the railroad men did not average 75 cents a day; that the influence of the road had been used to destroy the business of its best customers, the oil producers, for the purpose of building up individual interests. . The Columbia Oil Company, owned and controlled by J. Edgar Thompson, ex-president, and Thomas A. Scott, president of the Pennsylvania Railroad, and Andrew Carnegie, superintendent of the Allegheny Valley branch of the Pennsylvania Railroad, have been "dead-heading" all the oil the Columbia Oil Company's wells produce. The Carnegie Iron Works and the J. Edgar Thompson Steel Works, at and near Pittsburg, Pa., are and have been "dead-heading" the raw and manufactured iron ore, coal and coke and iron and steel over the road in the personal interest of J. Edgar Thompson, Thomas A. Scott and Andy Carnegie. What is the result. In place of the Pennsylvania Railroad Company receiving $7,000,000 in revenue this year, although shipments are in excess of last year, your road will receive scarcely $3,500,000. This alone would have enabled your company to pay us enough for a living." ("Dead-heading" means hauling freight or carrying passengers free).

Through Thomas A. Scott, the Standard Oil Company were given such low rates on transportation the Standard Oil Company grew rich, while the Pennsylvania Railroad became so poor it could not pay its employes living wages, which was the direct cause of the great railroad strike of 1877.

Thomas A. Scott, to prove his un-American principles, as soon as the strike was declared on the Pennsylvania Railroad, demanded State troops from the Governor, and the next day demanded United States troops from the President. On sight of the United States soldiers and the State Guards the strikers became enraged, and resisted their authority in giving the new men their places. This led up to the riot in which the taxpayers of the City of Pittsburg, Pa., and Allegheny county, Pa., compromised with the Pennsylvania Railroad Company for the burning of the Union depot and a few cars, $1,810,000. The Railroad filed claims for damages to the amount of $2,938,460, which was over $1,000,000 more than the cost of everything that was destroyed when it was new. Philadelphia, Harrisburg and other points on the road had the sad experience of entertaining United States soldiers at the cost of the taxpayers of the United States government. Also the taxpayers of Pennsylvania were called on to pay the State Guards to defend the railroad's property, and the whole trouble was caused by the dishonest methods of the high officials of the Pennsylvania Railroad, J. Edgar Thompson, Thomas A. Scott and Andrew Carnegie. Those three officials conspired against the stockholders of the road. The majority of the stock of the Columbia Oil Company, one of the largest oil producing properties on Oil Creek, Pa., was held by J. Edgar Thompson, at that time president of the Pennsylvania Railroad; Thomas A. Scott, vice president, and Andrew Carnegie, superintendent of the Allegheny Valley railroad branch of the Pennsylvania Railroad. From the Oil Creek oil regions to Pittsburg, Pa., and Buffalo, N. Y., the oil was "dead-headed" over the Pennsylvania System as the property of the Pennsylvania Railroad, when in fact it was the property of only three of the road's high officials. The same thing is true of the beginning of stockholders of the Carnegie Steel Company were J. Edgar Thompson, for whom the J. Edgar Thompson Steel Works, at Braddock, Pa., was named; Thomas A. Scott, for whom the Homestead, Pa., mills were to be named, and Andrew Carnegie, for whom the entire works were united in one and named Carnegie Steel Works. This company used the Pennsylvania System to carry its raw and manufactured iron ore, coal and coke, iron and steel, and by virtue of those three men being the highest officials of the Pennsylvania Railroad they gave themselves as the Carnegie Steel Company such low rates over the Pennsylvania Railroad that it did not pay for the equipment of the road, not to mention that there was nothing left in the way of revenue to pay the employes living wages, and nothing to pay the stockholders a dividend. Had the high officials of the Pennsylvania Railroad managed the road within the limits of the law, and the charter granted them as common carriers, and granted no favors to any person or company, but to charge the same rate to every shipper, no matter whether he was an official of the road or an individual shipper; had this law been

put in force and carried out, there would have been no strike; no lives would have been lost, and the taxpayers would not have had the burden of paying all of the loss caused by the strike, as the stockholders would have realized enough in revenue from the earning power of the road to pay its employes good wages and themselves a dividend on their stock. Had justice been meted out as it should have been J. Edgar Thompson, Thomas A. Scott and Andrew Carnegie should have been forever banished from America. This would have prevented Andrew Carnegie from placing a burden upon the people of the United States with his ill-gotten money by agreeing to build Carnegie libraries, conditional upon the people subscribing about one-half of the cost of building the library, and forever placing a burden upon themselves to maintain the library in a grand manner, while Carnegie or his estate holds a perpetual mortgage upon the library in the name of Carnegie Library. In the name of America, and the sense of pride and decency, will the people never learn to reject any and all Carnegie libraries, and each city and town issue bonds and build its own free library? Great honor is due the City of Wheeling, W. Va., for refusing to accept a Carnegie mortgaged library.

This great railroad strike was the cause of the second Congressional investigation into the rebate method of the Standard Oil Company and the railroads, and was the direct cause of the enactment of the Inter-State Commerce Law, which immediately went into effect. About this time the Erie Railroad was pressed for operating funds, and appealed to the Standard Oil Company for assistance. The Standard Oil Company agreed to give the Erie assistance providing the Erie would sell them the Erie docks and terminus at New York, Jersey City, N. J., Cleveland, Ohio and Chicago, and grant the Standard Oil Company a perpetual lease upon all the right of way of the Erie Railroad System for oil pipe lines. This agreement is now and has been in effect for a number of years.

Samuel Andrews, who sold his interest in the Standard Oil Company in August, 1879, to John D. Rockefeller, Henry M. Flagler and Oliver H. Payne, for $1,000,000, owing to disagreement with the management of the company's affairs, stated that the regular rate from Cleveland, Ohio, to New York, was $1.40 a barrel on oil, while the Standard Oil Company only paid 80 cents a barrel on all the oil they shipped, and the dividends of the Standard Oil Company for the years 1876, 1877 and 1878 were 50 per cent, above the investment.

NAMES AND TITLES OF THE CORPORATIONS OF THE STANDARD OIL COMPANY.

Pacific Coast Oil Company, incorporated under the laws of California, February 19, 1879. General office, San Francisco. Capital stock, $1,000,000. Number of shares, 100,000. Value per share, $10. Capital stock increased from $1,000,000 to $2,000,000 and $2,000,000 to $6,000,000. Directors: Charles N. Felton, San Francisco; L. D. Fisk, San Francisco; George Loomis, San Francisco; George M. Hedges, San Francisco; E. H. Forester, Alameda, Cal.

Standard Oil Company of New Jersey.—Was incorporated under the laws of the State of New Jersey, August 5th, 1882. The authorized capital stock at the time of its incorporation was $3,000,000, which was subsequently increased on March 19th, 1892, to $10,000,000. Another certificate increasing the capital stock to $110,000,000 was filed June 16th, 1898. The incorporators were Henry M. Flagler, New York; Thomas C. Bushnell, Morristown, N. J., and James McGee, Plainfield, N. J.

Standard Oil Company of New York—Incorporated under the laws of New York, August 18th, 1882. Capital stock authorized, $5,000,000. This amount was increased April 9th, 1892, to $7,000,000. The incorporators were William Rockefeller, J. A. Bostwick, Benjamin Brewster, O. B. Jennings and Charles Pratt.

Standard Oil Company of Iowa.—Incorporated under the laws of the State of Iowa, June 15th, 1885. The incorporators are John D. Archbold, W. H. Tilford and Samuel C. T. Dodd. Capital stock, $1,000,000. General office, Council Bluffs, Iowa.

Ohio Oil Company.—Incorporated under the laws of the State of Ohio, August 1st, 1887. Authorized capital, $2,000,000. Main office, Lima, Ohio. Incorporators, W. H. Mandeville, C. G. Cass, James McCormick, Samuel M. Jones and J. C. Sinclair.

South Penn Oil Company.—Incorporated under the laws of Pennsylvania, May 27th, 1889. Authorized capital stock, $2,000,000. Incorporators: Daniel O'Day, Buffalo, N. Y.; N. F. Clark, F. Loomis, J. R. Campbell, Wade Hampton, Jr., and Millard Scheide, all of Oil City, Pa.

South Penn Oil Company.—Admitted under the laws of the State of West Virginia, October 29th, 1889. A. B. Fleming, Attorney, Fairmont, W. Va.

REGULATIONS OF THE RELIEF ASSOCIATION OF EMPLOYES OF THE SOUTH PENN OIL COMPANY.

We, whose names are subscribed hereto, do hereby form an Association for the purpose of establishing and maintaining a fund from which to pay benefits to those members of the Association who, under the regulations hereinafter set forth, may be entitled to receive payment of such benefits.

Said Association shall be known as the Relief Association of Employees of the South Penn Oil Company, and hereinafter called the Association, and may be incorporated under the laws of any State, if desired by the members.

Said fund shall be known as the Relief Fund, and shall be established and maintained by monthly contributions of the amounts herinafter specified, from the members of the Association, and by the contributions of the South Penn Oil Company, herinafter called

the Company, and by the income arising from investments of such parts of the fund itself as may not be needed for the payment of benefits and the operating expenses of the Association.

The business of the Association shall be conducted in accordance with the following regulations:—

First.—No person shall be permitted to become a member of the Association unless at the date of his applying for membership herein he shall possess the following qualifications: (a) He shall be a regular employee of the Company, and if over fifty years of age shall have been an employee of such Company continuously for a period of at least two years immediately preceding his application for membership; (b) He shall be free from every infirmity, injury, disease and intemperate habit tending to shorten his life or increase his liability to personal injury.

Second.—Every application for membership shall be signed by the applicant in the presence of a subscribing witness, and shall be in the following form, viz.:—

APPLICATION FOR MEMBERSHIP IN THE RELIEF ASSOCIATION OF EMPLOYES OF SOUTH PENN OIL CO.

To the President of Said Association:—

I,....., of ....., in the County of ....., and State of....., employed in the service of the South Penn Oil Company as ..... in the ..... District, do hereby apply for membership in the Relief Association of Employees of the South Penn Oil Company, and hereby certify the following facts to be true:

1. My full name is .....

2. I was ..... years of age on my last birthday, which was .....

3. I have been engaged in my present employment for ..... immediately prior to the date of this application, and my experience in connection with the business of producing and transporting oil and natural gas has been as follows:

....

....

My father is ..... (Living or dead)? ..... My mother is ..... (Living or dead)? .....

The names of my wife and children, and the ages of my children, are as follows:

Name of wife, ...

Name of oldest child is .....; age, ... years.

Name of second child is .....; age, ... years.

Name of third child .....; age, ... years.

Name of fourth child is .....; age ..... years.

(Others in order.)

4. I am correct and temperate in my habits and have no mental or bodily infirmity, injury or disease which tends to shorten my life or increase my liability to personal injury, and am now able to earn a livelihood.

5. I agree to be bound by the regulations of said Association now in force and which may hereafter be adopted.

6. I agree that the acceptance of a benefit from the Relief Fund of said Association for sickness, bodily injury or death happening to me, shall operate as a release of all claims for damages against the South Penn Oil Company by reason of such injury or death which could be made by me or through me, and that I or my legal representatives will, upon request, execute such written instrument as may be necessary to evidence such release.

7. I agree to contribute to said Relief Fund the sum of ..... upon the acceptance of this application, and the sum of ..... each calendar month following that in which this application is made, while I remain a member of the Association, and that said monthly contributions may be deducted and paid to said Relief Fund from any wages or salary due me from my employer, or from benefits payable under the regulations.

In Witness Whereof, I have signed this application, this ..... day of ....., A. D. 190....

.....

Witness:

.....

Third—That every application for membership shall, when approved by the Chairman of the Auxiliary Board of the district in which the applicant may at the time be employed, be submitted to the Board of Control. If, upon investigation, said Board of Control shall find that the applicant is entitled to membership in the Association, said Board shall cause his name to be placed upon a roll of membership thereof; but if it shall be found that the applicant is not entitled to such membership, his application, together with the sum he may have remitted therewith as a contribution to the Relief Fund, shall be returned to him, said Board of Control and said Auxiliary Boards being the same provided for by Regulation Fourth hereof.

Fourth.—The Association shall begin business and its fiscal year shall begin on the first day of May, A. D. 1904. Its business shall be managed by a Board of Control and three Auxiliary Boards.

The Board of Control shall consist of seven members, six of whom shall be appointed by the Company and one shall be elected as hereinafter provided.

The representative above provided for to be chosen at large as member of the Board of Control shall be elected annually by the Auxiliary Boards in joint session, at time and place to be determined by said Boards from the list of nominations which must be submitted to said Boards at least ten days before the said joint session. Any candidate receiving the nomination of twenty-five members of the Association shall be eligible for election, and the one receiving the greatest number of votes at the joint session of the Auxiliary Boards shall be declared elected as representative to the Board of Control.

Fifth.—There shall be three Auxiliary Boards, known as the Auxiliary Board of District No. 1, the Auxiliary Board of District No. 2, and the Auxiliary Board of District No. 3.

The Chairman of each of these Boards will be the District Superintendent of the Company in the respective districts, unless some other selection of Chairman should be made by the Company; but the other members thereof will be elected annually by the members of the Association employed in the respective districts.

Sixth.—Each Auxiliary Board shall consist of five members, and shall have, in addition to a Chairman, a Secretary and such other officers as the members thereof may deem necessary for the transaction of the business committed to them. The member in each district receiving the highest number of votes at the annual election therein shall be Secretary of the Board; and in case of his inability, death, or resignation, the member receiving a number of votes next to the highest shall be the Secretary, and the vacancy caused by his advancement when the same may occur more than sixty days before an annual election, shall be filled by the election of a new member for the unexpired term at a special election to be held after ten days' notice, in the same manner as regular annual elections are to be held.

Seventh.—Elections for members of the respective Auxiliary Boards shall be held on the second Tuesday of December and on the same date in each year thereafter, between the hours of 10 o'clock A. M. and 2 o'clock P. M. Every such election shall be held by ballot, and every ballot shall have printed upon it the names of all the candidates to be voted for in the district in which such ballot is to be cast; but no person shall be voted for, nor shall his name be printed upon the ballots, unless at least ten members of the Association shall, at least twenty days before the election file with the Secretary of the Board of Control, a written request that his name be printed upon the ballots as a candidate. No member shall be permitted to vote for a number of candidates greater than the number to be elected, but any member may vote for a less number if he so desires. Every member casting a ballot shall indicate the persons for whom he intends to vote by striking out the names of all others printed upon the ballot. All ballots shall be securely sealed when cast, so as to conceal the names of the persons voted for. Every member casting a ballot must write or cause his name to be written on the back thereof, in the presence of a subscribing witness.

Eighth.—When five or more members shall assemble at the time and place fixed for holding an election they shall select a competent person to act as Receiver of Ballots, who may or may not be a member of the Association. All ballots shall be deposited with said Receiver of Ballots, who shall make duplicate lists of the names of the persons depositing the same and shall transmit one of said lists, together with all ballots received by him, to the Secretary of the Board of Control. The other said lists shall be retained by said Receiver of Ballots for at least three months after the election. The ballots shall be opened and the votes for each candidate counted by the Secretary of the Board of Control, in the presence and with the assistance of two members of the Association, not then candidates for any office therein. Neither said Secretary nor the members present when the votes are counted shall at any time disclose the name of any candidate for whom a member may vote without the consent of such member. Immediately after completing the count of votes the Secretary, and those assisting him, shall prepare and sign duplicate certificates, showing the number of votes cast for each of the candidates in the respective districts. One of said duplicate certificates, showing the number of votes cast for the several candidates in each district, shall be transmitted to the Receiver of Ballots in the respective districts.

All elections and appointments herein provided for shall for the first year, be held and made as soon as practicable after the formation of the Association, the incumbents thus selected to hold office until the regular election time or time of appointment first occurring thereafter.

Ninth.—It shall be the duty of the Chairman of the Auxiliary Boards to investigate the circumstances surrounding each application for membership in the Association, made by persons within their respective districts, and to recommend to the Board of Control that the same be granted or refused, as in their judgment may be proper. If objection be made by any member of the Association to the granting of an application for membership, such objection shall be considered by the proper Auxiliary Board, and such recommendation made to the Board of Control as may be favored by a majority of the Auxiliary Board.

The Board of Control shall, in the admission of members, follow the recommendation of the proper Auxiliary Board, unless said Board of Control shall be of opinion that an error has been made by the Auxiliary Board in that regard, in which case both Boards shall together reconsider the application and determine whether the same shall be granted or refused.

Tenth.—It shall also be the duty of all members of the Auxiliary Board to inquire concerning every case of sickness, injury and death among the members of the Association in their respective districts, and report the same to the Secretary of the Board of Control.

Eleventh.—The respective Auxiliary Boards shall meet within five days after the beginning of each fiscal year, and at such other times as may be necessary for the interests of the Association.

Twelfth.—Within their respective districts, the Auxiliary Boards shall, with the concurrence of the Boards of Control, have power to expel any member of the Association for any of the following causes: (a) Non-payment of two or more regular monthly contributions to the Relief Fund; (b) False representation or fraudulent concealment made or practiced for the purpose of securing membership in the Asso-

ciation; (c) Habitual drunkenness; (d) Disobedience of the order of those having control over him in his employment, when such disobedience shall directly or indirectly endanger life, limb or property; (e) Feigning disability from sickness or accident for the purpose of obtaining payment of a benefit when not entitled thereto under these regulations, or for the purpose of obtaining a greater benefit than such member may be entitled to.

Thirteenth.—The Board of Control shall meet on the first business day of each fiscal year, and at such other times as the business of the Association may require. In case of a failure to meet on said day, those members thereof previously in office shall hold over until the incoming Board shall meet and assume the duties of office.

Fourteenth.—The Board of Control shall have power to prescribe the manner of keeping the books of account and other records of the Association; to adopt such written and printed forms as they may deem proper for the orderly and prompt transactions of its business; to approve or refuse applications for membership previously acted upon by an Auxiliary Board as provided in Regulation Ninth hereof; to inquire concerning every claim for payment of a benefit, and approve or reject the same after a report shall have been made thereon by the proper Auxiliary Board; to designate the depository of the Relief Fund and fix the amount of the bond or bonds to be given for the security of the same; to invest from time to time such parts of the Relief Fund as may not be needed to pay benefits and to meet the operating expenses of the Association; to fix the compensation of the Treasurer and Secretary of the Board of Control and of such assistants as they or either of them may require; to employ counsel; to designate the places at which annual and special elections of members of the Auxiliary Boards shall be held; to expel any member of the Association for any of the causes specified in the regulations; and to exercise all other powers and authority necessary for the proper management of the business of the Association and not by these regulations delegated to the Auxiliary Boards.

Fifteenth.—The members of the Association shall, as regards the amount of their monthly contributions to the Relief Fund, be divided into three classes, to be designated as Class 1, Class 2 and Class 3, respectively. Those receiving wages in amounts not exceeding $75.00 per month when admitted to membership shall belong to Class 1, and shall contribute each month the sum of one dollar. Those receiving wages in amounts over $75.00 and not exceeding $100.00 per month when admitted to membership shall belong to Class 2, and shall contribute each month the sum of one dollar and fifty cents. Those receiving wages in amounts over $100.00 per month when admitted to membership shall belong to Class 3, and shall contribute each month the sum of two dollars.

When any member is receiving a Sick Benefit, as provided in Regulation Eighteenth, and his contribution, when due, is not otherwise paid, the Company shall have the right to deduct the amount of such contribution from the Benefit, and give credit to said member therefor. Contributions shall be due and payable on the first business day of every month.

Sixteenth.—The benefits to be paid to members of the Association, who by these rules may become entitled to payment of benefits, shall be designated as Sick Benefits and Death Benefits. By Sick Benefits shall be understood the sums payable to members of the Association on account of disabilities due to sickness or accident not resulting in death; by Death Benefits, the sums payable on account of the death of members resulting from disease or accident.

Seventeenth.—Benefits will be paid on account of the disablement or death of members whose contributions to the Relief Fund shall have been paid in full and who shall have complied with these regulations of the amounts and under the circumstances mentioned and described in Regulation Number Eighteen, viz.:

Eighteenth.—Those members in Class 1, disabled by sickness or accident to such an extent as to disqualify them for their employment, shall be paid a *Sick Benefit* of one dollar for each day the disability may continue, during a period not exceeding twenty-six weeks, and fifty cents for each day during the period of twenty-six weeks following thereafter; but when a member returns to duty after a disability from sickness for which he is entitled to payment of a benefit, and within two weeks after such return is again disabled by sickness or by accident of such character as would entitle him to payment of a Sick Benefit, such second disability shall be counted with the first in computing the time for which benefits are to be paid him.

Those of Class 2, disabled by sickness or accident to such an extent as to disqualify them for their employment, shall be paid a Sick Benefit of one dollar and twenty-five cents for each day the disability may continue, during a period not exceeding twenty-six weeks, and sixty-three cents for each day during the period of twenty-six weeks following thereafter; but when a member returns to duty after a disability from sickness for which he is entitled to payment of a benefit, and within two weeks after such return is again disabled by sickness or by accident of such character and under such circumstances as would entitle him to payment of a Sick Benefit, such second disability shall be counted with the first in computing the time for which benefits are to be paid.

Those members of Class 3, disabled by sickness or accident to such an extent as to disqualify them for their employment, shall be paid a Sick Benefit of one dollar and fifty cents for each day the disability may continue during a period not exceeding twenty-six weeks, and seventy-five cents for each day during the period of twenty-six weeks following thereafter; but when a member returns to duty after a disability from sickness for which he is entitled to payment of a benefit and within two weeks after such return is again disabled by sickness or by accident of such character and

under such circumstances as would entitle him to payment of a Sick Benefit, such second disability shall be counted with the first in computing the time for which benefits are to be paid.

Sick Benefits, payable for disabilities occurring or existing in any month, shall be paid at the end of that month.

In all cases of disability a certificate of a physician in regular practice must be presented to the Board of Control when required by said Board.

Nineteenth.—Members will not be entitled to Sick Benefits for time during which wages are paid to them by their employers, and such time will be deducted in computing the amount to be paid by the Association.

Twentieth.—When the death of a member results from disease or accident contracted or occurring after his admission to membership, the person or persons who by these rules may be entitled to payment of a benefit on account of such death, shall be paid a Death Benefit of one thousand dollars if the decedent was a member in Class 1; fifteen hundred dollars if a member of Class 2; and two thousand dollars if a member of Class 3; less such amount as may have been paid for Sick Benefits to or for the use of such decedent member during the sickness immediately preceding and terminating in his death.

Twenty-first.—Claims for Death Benefits will be paid within ten days after satisfactory evidence of their validity shall have been furnished to the Board of Control. All other claims will be paid monthly.

Twenty-second.—Neither Sick Benefits nor Death Benefits for disability or death, resulting from accidents, will be paid in any case unless the accident causing the disability or death shall happen while the member is actually engaged in the duties of his employment, or being on the way to or from the place of his work or at home, or in attempting to save the property of his employer from injury or destruction or to save the persons or property of others from being injured or destroyed by the operation of or in consequence of an accident happening to the property, machinery or appliance of his employer.

Twenty-third.—Sick Benefits will in all cases be paid to the members on account of whose disability they may become payable.

Twenty-fourth.—Death Benefits shall be paid to those who by law would be entitled to take the deceased member's personal estate in case of his intestacy, except when the deceased member shall have appointed, in the manner prescribed by these regulations, some other person or persons beneficiary to receive payment thereof, in which case payment shall be made to such beneficiary or beneficiaries.

Twenty-fifth.—Death Benefits for death resulting from accident shall be paid to the widow, children or parents of the member on account of whose death the same may become payable. If such deceased member shall leave a widow, but no children, such widow shall be entitled to receive payment of the whole amount of such Death Benefits; if he shall leave a widow and children, said Death Benefit shall be paid to them in the same proportions as they would take his personal estate in case of intestacy; if he shall leave children, but no widow, said Death Benefit shall be paid to such children in the same proportions as they would take his personal estate in case of intestacy; if he shall leave neither widow nor children, but leave a father and mother jointly, if both be living, or to the survior if one of them be dead. Any member who at the time of applying for membership in the Association shall have neither wife, child, father or mother, may, if he so elects, appoint such person or persons as beneficiary or beneficiaries of the Death Benefit secured to him by membership in the Association, as he may see fit, if but one person be so designated, he or she shall receive payment of the whole of said Death Benefit, or if more than one be so designated, they shall be paid said Death Benefit in equal shares, or in such other proportions as such member may request in his application. The marriage of a member subsequent to his appointment of a beneficiary of the Death Benefit secured by his membership, shall be a revocation of such appointment.

Twenty-sixth.—Any member may withdraw from the Association after having given one month's notice of his intention so to do, and paying all contributions (if any) for which he may be in arrears prior to and including the date of said notice. Such withdrawal shall operate as a release by the withdrawing member of all claim or claims for any benefit accruing subsequent to the expiration of said notice, and a release of all claim to reimbursement for any part of the sums contributed by him to said fund while a member of the Association.

Twenty-seventh.—Members of the Association who may be discharged for cause from the service of the Company shall forfeit all claim for benefits on account of any disability accruing after the date of such discharge takes effect, and all claims to reimbursement for any part of the moneys contributed by him to the Relief Fund.

The words "discharged for cause," as used in these regulations, will be taken as including dismissal because of incompetency, inattention to duty, disobedience of orders, drunkenness and immoral habits tending to diminish the efficiency of the person addicted thereto in the performance of his duties.

Twenty-eighth.—Members who may be dismissed without fault on their part from the service of the Company, so long as they continue to pay regularly to said Fund the contribution specified in Regulation Eighteen, remain members of the Association and shall be entitled to receive Sick Benefits and Death Benefits under such circumstances as would entitle them to Sick Benefits or Death Benefits if they had continued in the service of the Company but if any member so dismissed shall at any time fail to pay any such contribution, such failure shall *ipso facto* terminate his membership and cause a forfeiture of all rights to receive payment of

any benefit or part thereof for disability occurring after the date of such failure, and shall cause a forfeiture of all right to reimbursement or any part of the contribution paid by him to said Fund.

Twenty-ninth.—Members who may obtain leave of absence or be temporarily dismissed from the service of the Company may preserve their membership in the Association, and their right to receive Sick Benefits and Death Benefits by paying regularly to the Relief Fund the contribution required by Regulation Number Eighteen.

Thirtieth.—Whenever the amount contributed by any member shall be one hundred dollars in excess of all benefits paid to him, and the Fund exceeds two hundred thousand dollars he shall be relieved from the payment of further contributions until the amount in said Fund shall be reduced to two hundred thousand dollars by the payment of benefits and operating expenses, except that those who may become members while such suspension of contributions exists and whose contributions have not severally reached the amount of one hundred dollars, shall be required to pay their contributions regularly as if the suspension had not occurred.

When the amount contributed by any member, whose contributions have been suspended, shall fall below one hundred dollars in excess of all benefits paid to him, his contributions shall be resumed in all respects the same as before such suspension.

Thirty-first.—If at any time the membership of the Association shall be reduced to below five hundred, such reduction shall operate to dissolve the Association at midnight of the last day of the month in which it shall occur.

The Association may also be dissolved, notwithstanding the membership may exceed five hundred, by the vote of its members. For the purpose of taking such vote fifteen per centum or more of the members may sign and file with the President of the Board of Control a written proposal to dissolve, and said President shall forthwith give notice thereof by mail to all members, and shall in said notice give notice of a time and place at which the votes of the members will be taken for and against a dissolution. If it should be found that a majority of the members favor a dissolution, the Association shall be deemed dissolved at midnight of the day on which the vote shall be taken, notwithstanding the votes may not be counted until the next of a subsequent day. If it should be found that a majority are against a dissolution, the Association shall continue as before.

No member shall be entitled to payment of a benefit for any disability or death consequent upon any accident which may happen after midnight of the day on which a vote to be taken showing a majority of the members in favor of dissolving the association, but those who at that time may be disabled by sickness previously contracted or by accidental injuries previously sustained, shall receive the same benefits as they would have received if there had been no dissolution.

In the event of a dissolution, all liabilities of the Association shall be paid out of the Relief Fund, if sufficient for that purpose; but if said Relief Fund shall not be sufficient to meet said liabilities, the same shall be paid pro rata, and no member of the Association nor the Company shall be liable for the payment of any part of said liabilities beyond the amount of the said unpaid monthly contributions due from such member or company at the date of such dissolution.

If after payment of such liabilities a balance shall remain in the Relief Fund, the same shall be distributed among the then members and the Company in proportion to the whole amount they may have contributed to the said Fund.

Thirty-second.—The Company agrees to contribute to the Relief Fund, for the first five years, each month a sum equal to twenty-five per centum of the amount contributed thereto by its employes during the same month, and from and after the expiration of said period of five years it agrees to contribute the sum of ten per centum of the amount contributed by its employes during the same month.

At the end of the first five years the Company will consider the propriety of continuing to pay twenty-five per centum of the amount contributed by its employes each month, and if it continues to pay twenty-five per centum of the amount contributed by its employes, it will be considered a voluntary payment, and it may be discontinued at the option of the Company.

Thirty-third.—The acceptance of a benefit by a member of the Association or by those entitled to receive the same in case of his death, shall operate as a release by such member, or ,in case of his death by those receiving payment of the benefit of all claims for damages which could be made by such member or by those claiming by, through or under him against the Company.

Thirty-fourth.—The contributions which members are required to pay by the foregoing Regulations are estimated to be sufficient to pay all benefits and operating expenses of the Association. Should said contributions be found insufficient for said expenses, they may be increased, or if found greater than necessary they may be reduced; but such increase or reduction shall only be made by joint action of the Board of Control and all Auxiliary Boards.

Thirty-fifth.—This Association shall not be considered formed until at least five hundred and one employes of the Company possessing the qualifications specified in Regulation First hereof shall have signified their willingness to become members thereof and to be bound by these Regulations by affixing their signatures hereto or to printed copies hereof, and shall each have signed an application for membership in the form set forth in said Regulation First.



THE NEAREST RAILROAD POINTS TO TITUSVILLE AND OIL CREEK, PA., IN 1859



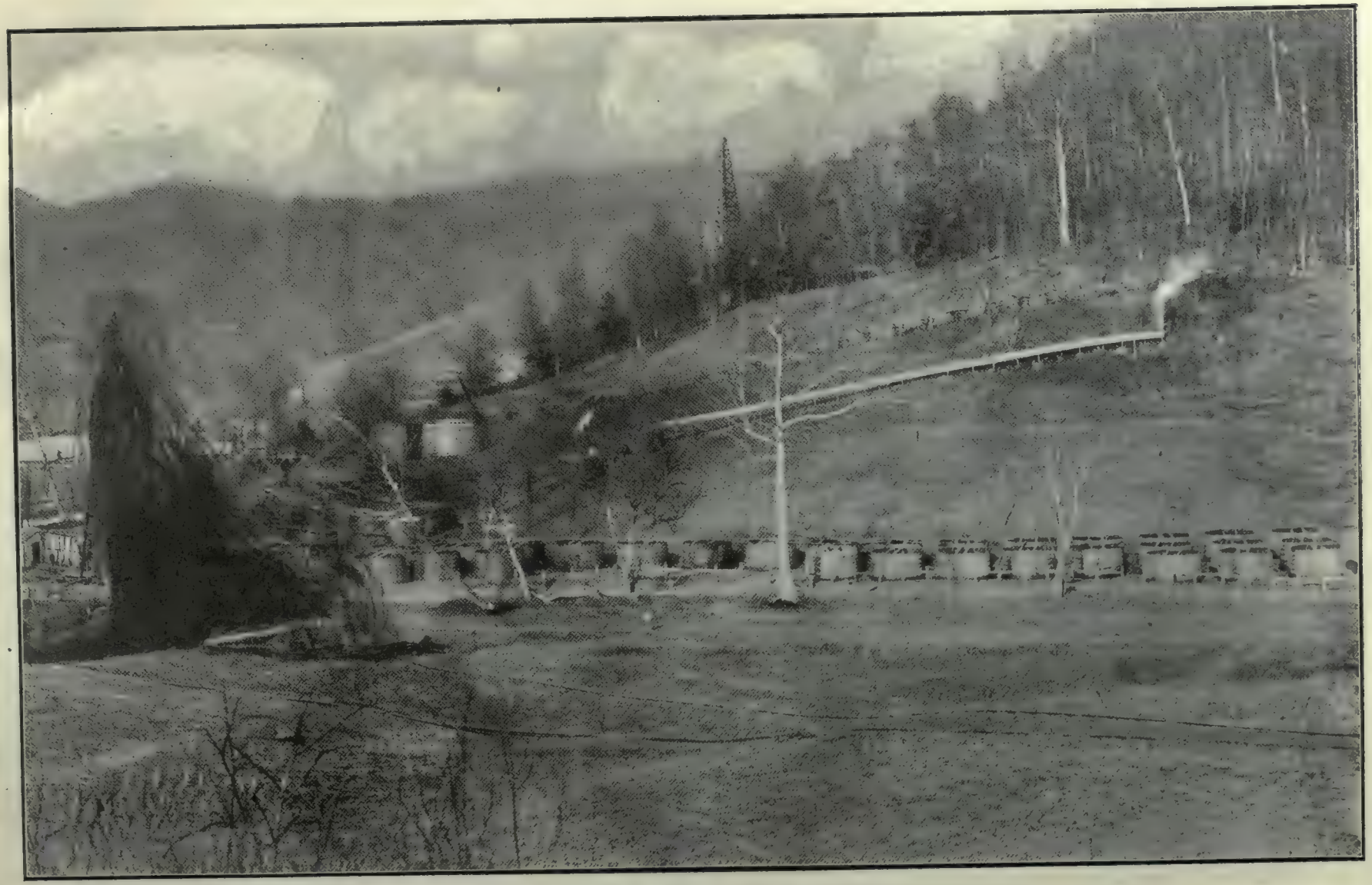
SAND FORK OIL FIELD, LEWIS COUNTY, WEST VIRGINIA

Copley Heirs Well No. 1, Turner Well No. 1, Mullady Well No. 1. Copley Heirs Well No. 1, the largest oil well struck in West Virginia, drilled in the Gordon Sand, September 22, 1900, and produced 7,000 barrels of oil the first 24 hours. South Penn Oil Company owners.



M. COPLEY HEIRS' FARM WELL NO. 1

Largest Oil Well in West Virginia (South Penn Oil Co., Owners) Sand Fork, Lewis Co., West Virginia



M. COPLEY HEIRS FARM WELL NO 1

(120 Oil Tanks) Production of Well First 24 Hours 7000 Barrels of Oil. SAND FORK, LEWIS COUNTY, WEST VIRGINIA



POINT HILL-HAS PRODUCED
$7,000,000 WORTH OF LUBRICATING OIL, FRANKLIN PA



POWER HOUSE ON THE FINLETTER LEASE. HEAVY OIL DISTRICT
NEAR FRANKLIN PA. IT FURNISHES POWER FOR 75 WELLS



ROUSTABOUT GANG
DEAD FALL, W.VA.



F.L. BLACK & BROS. OIL COUNTRY BOARDING HOUSE
SAND FORK, LEWIS CO. W.VA.



DRILLERS HOME
IN THE EARLY DAYS OF SAND FORK, LEWIS CO. W.VA



FOLSOM, WEST VIRGINIA
(Folsom Oil Field)



OIL COUNTRY MACHINE AND BLACKSMITH SHOP
(H. W. RANK, OWNER) FOLSOM-ROBINSON, WEST VIRGINIA



COLTER'S CAMP
(Folsom-Robinson Oil Field) Folsom-Robinson, Wetzel County, West Virginia



SOUTH PENN OIL COMPANY'S ROUSTABOUT OR CONNECTION GANG
E. W. Rouse, Foreman, 1897. Smithfield, West Virginia



RAILROADS BUILT IN OIL REGION OF OIL CREEK, PA., FROM 1860 TO 1872

ORGANIZED UNDER THE MANUFACTURING LAWS OF OHIO.

No. 293 — 34993 Shares.

STANDARD OIL COMPANY.



CAPITAL STOCK
$3.500.000.
ALL PAID.

35.000 SHARES.
$100 EACH.



This is to Certify that Trustees of Standard Oil Trust is entitled to ~~Thirty four Thousand nine hundred ninety three~~ Shares of One Hundred Dollars each in the Capital Stock of the **Standard Oil Company**, transferable on the Books of the Company in person or by Attorney only on the surrender of this Certificate and due payment of all liabilities on the part of the holder to the Company: subject to the provisions of Law and the By Laws of the Company. This Certificate is valid only when signed by the President and Secretary.

Cleveland, O. Dec 23 1882

H. M. Flagler Secy

J. D. Rockefeller Prest.



THE FIRST BUILDING OCCUPIED BY THE STANDARD OIL COMPANY AT CLEVELAND OHIO IN 1870.

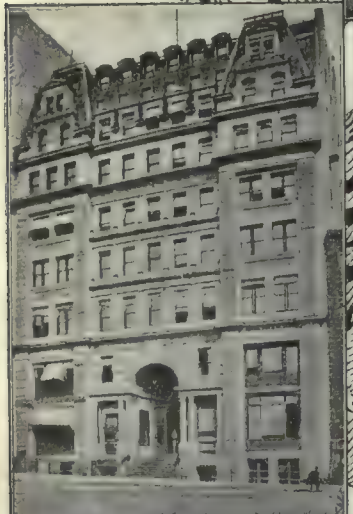


STANDARD OIL COMPANY'S BUILDING IN 1892 AT 26 BROADWAY, NEW YORK.

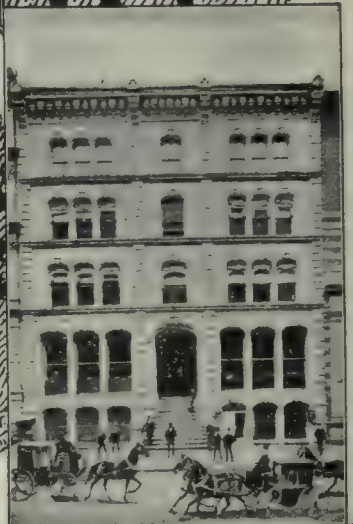


NEW STANDARD OIL BUILDING
26 BROADWAY NEW YORK.

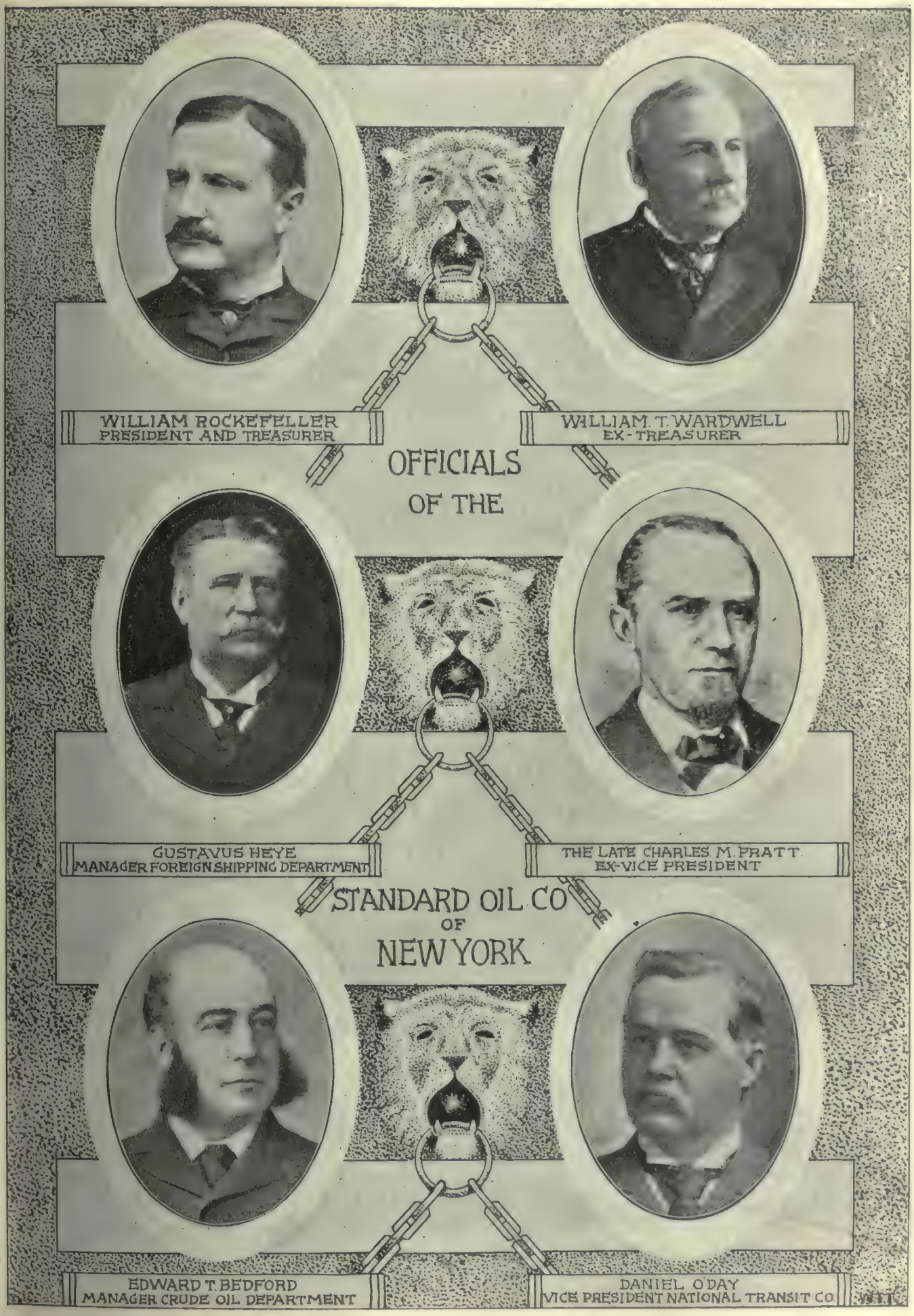
JARVIS ENG. CO.



SEABOARD NATIONAL BANK
STANDARD OIL BANK
18 BROADWAY NEW YORK.



NATIONAL CITY BANK OF NEW YORK
STANDARD OIL BANK
52 WALL ST. NEW YORK


WILLIAM ROCKEFELLER
PRESIDENT AND TREASURER
WILLIAM. T. WARDWELL
EX-TREASURER
OFFICIALS
OF THE
GUSTAVUS HEYE
MANAGER FOREIGN SHIPPING DEPARTMENT
THE LATE CHARLES. M. PRATT.
EX-VICE PRESIDENT
STANDARD OIL CO
OF
NEW YORK
EDWARD T. BEDFORD
MANAGER CRUDE OIL DEPARTMENT
DANIEL O'DAY
VICE PRESIDENT NATIONAL TRANSIT CO.



JOHN DAVIDSON ROCKEFELLER, SR., (Oil King)
Founder and President of the Standard Oil Company



STANDARD OIL COMPANIE'S
OIL TANK STEAMER "STANDARD"



OIL REFINERY
AT SUNSET CALIFORNIA.



DEEPEST PRODUCING OIL WELL IN THE WORLD. GENINE FARM WELL, NO. 17
(South Penn Oil Company, Owners) Folsom-Robinson Oil Field, Wetzel County, West Virginia

The South Penn Oil Company has not been able to organize their employes into relief associations, owing to the employes not agreeing to the articles of agreement and regulations of the Relief Association of Employees of the South Penn Oil Company.

Carter Oil Company—Incorporated under the laws of the State of West Virginia, May 1, 1893. Authorized capital, $2,000,000. Amount subscribe l, $1,000,000 Amount paid in, $100,000. Par value shares, $100. Principal office, Titusville, Pa. Incorporators, John J. Carter, Titusville, Pa.; Geo. A. Eckbert, Titusville, Pa.; John F. Eckbert, Sistersville, W. Va.; John C. Machale, Titusville, Pa.; Chas. F. Carter, Titusville, Pa.

Standard Oil Company of California—Incorporporated under the laws of California, August 11, stock, $300,000. Number of shares, 60,000; value per share, $5.00. Directors, H. H. Lynch, San Francisco; N. S. Farley, Oakland; L. F. Gilmore, San Francisco; John M. Wright, San Francisco; W. E. Dargil, Oakland.

Standard Oil Company of New York—Admitted under the laws of West Virginia February 12, 1901; C. W. Archbold, Attorney, Parkersburg, W. Va.

TRUST AGREEMENTS AND SUBSEQUENT CONSOLIDATED CORPORATIONS.

The managers of the Standard Oil Company of Ohio and of other companies associated with it, found that pools and ordinary forms of agreement regarding prices and output did not give sufficient power over the various members, either to control the market or to secure the most efficient methods of production. In consequence this company first devised and put into effect the so-called trust agreement, by which numerous individuals, firms, and corporations, formerly competitors, were brought together in 1882 into one Standard Oil Trust. The trust was organized substantially as follows: A board of nine trustees received in trust from the different parties to the agreement, either an assignment of stock with full voting power, or in some other way the absolute control of the management of the separate properties. The trustees issued in return for these assignments, or other controlling power, trust certificates representing the respective valuations of the plants. All the properties were then managed by these nine trustees in complete harmony. The profits were distributed among the holders of the trust certificates as if they were dividends on stock, independent of the question whether the original property, for which one had received his trust certificate, was making profits or was idle.

STANDARD OIL TRUST.

The word "Trust" originated with the Standard Oil Company in 1882, when the stock of the twenty allied companies was placed in the safe keeping and management of nine trustees, who were duly elected to manage the affairs of the Standard Oil Trust on the dividend profit sharing plan.

THE STANDARD OIL TRUST AGREEMENT, CHARTERS AND BY-LAWS.

This agreemnt, made and entered upon this second day of January, A. D. 1882, by and between all the persons who shall now or may hereafter execute the same as parties thereto witnesseth:

I. It is intended that the parties to this agreement shall embrace three classes, to wit:

(1) All the stockholders and members of the following corporations and limited partnerships, to wit:

Acme Oil Company (New York), Acme Oil Company (Pennsylvania), Atlantic Refining Company of Philadelphia, Bush & Company Limited, Camden Consolidated Oil Company, Elizabethport Acid Works, Imperial Refining Company Limited, Chas. Pratt & Company, Paine,Ablett & Company Limited, Standard Oil Company (Ohio), Standard Oil Company (Pittsburg), Smith's Ferry Oil Transportation Company, Solar Oil Company Limited, Sone & Fleming Manufacturing Company Limited.

Also all the stockholders and members of such other corporations and limited partnerships as may hereafter join in this agreement at the request of the trustees herein provided for.

(2) The following individuals, to wit:

W. C. Andrews, John D. Archbold, Lide K. Arter, J. A. Bostwick, Benj. Brewster, D. Bushnell, Thomas C. Bushnell, J. N. Camden, Henry G. Davis, H. M. Flagler, Mrs. H. M. Flagler, H. M. Hanna, and George W. Chapin, D. M. Harkness, D. M. Harkness, trustee; S. V. Harkness, John Huntington, H. A. Hutchins, Chas. F. G. Heye, O. B. Jennings, Chas. Lockhart, A. M. McGregor, Wm. H. Macy, Wm. H. Macy, jr., estate of Josiah Macy, jr., Wm. H. Macy, jr., executor; O. H. Payne, O. H. Payne, trustee; Chas. Pratt, Horace A. Pratt, C. M. Pratt, A. J. Pouch, John D. Rockefeller, Wm. Rockefeller, Henry H. Rogers, W. P. Thompson, J. J. Vandergrift, Wm. T. Wardwell, W. G. Warden, Joseph L. Warden; Warden, Frew & Co., Louise C. Wheaton, Julia H. York, George H. Vilas, M. R. Keith, Geo. F. Chester, trustees.

Also all such individuals as may hereafter join in this agreement at the request of the trustees herein provided for.

(3) A portion of the stockholders and members of the following corporations and limited partnerships, to wit:

American Lubricating Oil Company, Baltimore United Oil Company, Beacon Oil Company, Bush & Denslow Manufacturing Company, Central Refining Company of Pittsburg, Chesebrough Manufacturing Company, Chess-Carley Company, Consolidated Tank Line Company, Inland Oil Company, Keystone Refining Company, Maverick Oil Company, National Transit Company, Portland Kerosene Oil Company, Producer's Con'd Land

and Petroleum Company, Signal Oil Works, Limited; Thompson & Bedford Company, Limited; Devoe Manufacturing Company, Eclipse Lubricating Oil Company, Limited; Empire Refining Company, Limited; Franklin Pipe Company, Limited; Galena Oil Works, Limited; Galena Farm Oil Company, Limited; Germania Mining Company, Vacuum Oil Company, H. C. Van Tine & Co., Limited; Waters-Pierce Oil Company.

Also stockholders and members (not being all thereof) of other corporations and limited partnerships who may hereafter join in this agrement at the request of the trustees herein provided for.

II. The parties hereto do covenant and agree to and with each other, each in consideration of the mutual covenants and agreements of the other, as follows:

(1) As soon as practicable a corporation shall be formed in each of the following States, under the laws thereof, to wit: Ohio, New York, Pennsylvania and New Jersey; provided, however, that instead of organizing a new corporation, any existing charter and organization may be used for the purpose when it can advantageously be done.

(2) The purpose and powers of said corporations shall be to mine for, produce, manufacture, refine, and deal in petroleum and all its products, and all the materials used in such business, and transact other business collateral thereto. But other purposes and powers shall be embraced in the several charters such as shall seem expedient to the parties procuring the charter, or, if necessary to comply with the law, the powers aforesaid may be restricted and reduced.

(3) At any time hereafter, when it may seem advisable to the trustees herein provided for, similar corporations may be formed in other States and Territories.

(4) Each of said corporations shall be known as the Standard Oil Co. of ..... (and here shall follow the name of the State or Territory by virtue of the laws of which said corporation is organized).

(5) The capital stock of each of said corporations shall be fixed at such an amount as may seem necessary and advisable to the parties organizing the same, in view of the purpose to be accomplished.

(6) The shares of stock of each of said corporations shall be issued only for money, property, or assets equal at a fair valuation to the par value of the stock delivered therefor.

(7) All of the property, real and personal, assets, and business of each and all of the corporations and limited partnerships mentioned or embraced in class (1) shall be transferred to and vested in the said several Standard Oil companies. All of the property, assets and business in or of each particular State shall be transferred to and vested in the Standard Oil Co. of that particular State, and in order to accomplish such purpose the directors and managers of each and all of the several corporations and limited partnerships mentioned in class first are hereby authorized and directed by the stockholders and members thereof (all of them being parties to this agreement) to sell, assign, transfer, convey, and make over, for the consideration hereinafter mentioned, to the Standard Oil Co. or companies of the proper State or States, as soon as said corporations are organized and ready to receive the same, all the property, real and personal, assets and business of said corporations and limited partnerships. Correct schedules of such property, assets and business shall accompany each transfer.

(8) The individuals embraced in class second of this agreement do each for himself agree, for the consideration hereinafter mentioned, to sell, assign, transfer, convey, and set over all the property, real and personal, assets, and business mentioned and embraced in schedules accompanying such sale and transfer to the Standard Oil Company or Companies of the proper State or States, as soon as the said corporations are organized and ready to receive the same.

(9) The parties embraced in class third of this agreement do covenant and agree to assign and transfer all of the stock held by them in the corporations or limited partnerships herein named, to the trustees herein provided for, for the consideration and upon the terms hereinafter set forth. It is understood and agreed that the said trustees and their successors may hereafter take the assignment of stocks in the same or similar companies upon the terms herein provided, and that whenever and as often as all the stocks of any corporation and limited partnership are vested in said trustees the proper steps may then be taken to have all the money, property, real and personal, of said corporation or partnership assigned and conveyed to the Standard Oil Company of the proper State on the terms and in the mode herein set forth, in which event the trustees shall receive stocks of the Standard Oil Company equal to the value of the money, property and business assigned, to be held in place of the stocks of the company or companies assigning such property.

(10) The consideration for the transfer and conveyance of the money, property, and business aforesaid to each or any of the Standard Oil Companies shall be stock of the respective Standard Oil Company to which said transfer or conveyance is made, equal at par value to the appraised value of the money, property and business so transferred. Said stock shall be delivered to the trustees hereinafter provided for, and their successors, and no stock of any of said companies shall ever be issued except for money, property, or business equal at least to the par value of the stock so issued, nor shall any stock be issued by any of said companies for any purpose except to the trustees herein provided for, to be held subject to the trusts hereinafter specified. It is understood, however, that this provision is not intended to restrict the purchase, sale, and exchange of property of said Standard Oil Companies as fully as they may be authorized to do by their respective charters, provided only that no stock be issued therefor except to said trustees.

(11) The consideration for any stock delivered to said trustees as above provided for, as well as for stocks delivered to said trustees by persons mentioned or included in class third of this agreement, shall be the delivery of said trustees, to the persons entitled thereto, of trust certificates hereinafter provided for, equal at par value to the par value of the stocks of the

said Standard Oil Companies so received by said trustees, and equal to the appraised value of the stocks of other companies or partnerships delivered to said trustees. (The said appraised value shall be determined in a manner agreed upon by the parties in interest and said trustees). It is understood and agreed, however, that the said trustees may, with any trust funds in their hands, in addition to the mode above provided, purchase the bonds and stocks of other companies engaged in business similar or collateral to the business of said Standard Oil companies on such terms and in such mode as they may deem advisable, and shall hold the same for the benefit of the owners of said trust certificates, and may sell, assign, transfer, and pledge such bonds and stocks whenever they may deem it advantageous to said trust so to do.

III. The trusts upon which said stocks shall be held, and the numbers, powers, and duties of said trustees, shall be as follows:—

(1) The number of trustees shall be nine.

(2) J. D. Rockefeller, O. H. Payne and Wm. Rockefeller are hereby appointed trustees, to hold their office until the first Wednesday of April, A. D. 1885.

(3) J. A. Bostwick, H. M. Flagler and W. G. Warden are hereby appointed trustees, to hold their office until the first Wednesday of April, A. D. 1884.

(4) Chas. Pratt, Benj. Brewster and John D. Archbold are hereby appointed trustees, to hold their office until the first Wednesday of April, A. D. 1883.

(5) Elections for trustees to succeed those herein appointed shall be held annually, at which election a sufficient number of trustees shall be elected to fill all vacancies, occurring either from expiration of the term of office of trustee or from any other cause. All trustees shall be elected to hold their office for three years, except those elected to fill a vacancy arising from any cause except expiration of term, who shall be elected for the balance of the term of the trustee whose place they are elected to fill. Every trustee shall hold his office until his successor is elected.

(6) Trustees shall be elected by ballot by the owners of trust certificates or their proxies. At all meetings the owners of trust certificates who may be registered as such on the books of the trustees may vote in person or by proxy, and shall have one vote for each and every share of trust certificates standing in their names; but no such owner shall be entitled to vote upon any share which has not stood in his name thirty days prior to the day appointed for the election. The transfer books may be closed for thirty days immediately preceding the annual election. A majority of the shares represented at such election shall elect.

(7) The annual meeting of the owners of said trust certificates for the election of trustees and for other business shall be held at the office of the trustees in the city of New York on the first Wednesday of April of each year, unless the place of meeting be changed by the trustees, and said meeting may be adjourned from day to day until its business is completed. Special meetings of the owners of said trust certificates may be called by the majority of the trustees at such times and places as they may appoint. It shall also be the duty of the trustees to call a special meeting to holders of trust certificates whenever requested to do so by a petition signed by the holders of 10 per cent in value of such certificates. The business of such special meetings shall be confined to the object specified in the notice given therefor. Notice of the time and place of all meetings of the owners of trust certificates shall be given by personal notice as far as possible and by public notice in one of the principal newspapers in each State in which a Standard Oil Co. exists at least ten days before such meeting. At any meeting a majority in the value of the holders of trust certificates represented consenting thereto, by-laws may be made, amended, or repealed, relative to the mode of election of trustees and other business of the holders of trust certificates; provided, however, that said by-laws shall be in conformity with this agreement. By-laws may also be made, amended, and repealed at any meeting, by and with the consent of a majority in value of the holders of trust certificates, which alter this agreement relative to the number, powers and duties of the trustees and to other matters tending to the more efficient accomplishment of the objects for which the trust is created, provided only that the essential intents and purposes of this agreement be not thereby changed.

(8) Whenever a vacancy occurs in the Board of Trustees more than sixty days prior to the annual meeting for the election of trustees, it shall be the duty of the remaining trustees to call a meeting of the owners of the Standard Oil Trust certificates for the purpose of electing a trustee or trustees to fill a vacancy or vacancies. If any vacancy occurs in the Board of Trustees, from any cause, within sixty days of the date of the annual meeting for the election of trustees, the vacancy may be filled by a majority of the remaining trustees, or, at their option, may remain vacant until the annual election.

(9) If, for any reason, at any time, a trustee or trustees shall be appointed by any court to fill any vacancy or vacancies in said Board of Trustees, the trustee or trustees so appointed shall hold his or the respective office or offices only until a successor or successors shall be elected in the manner above provided for.

(10) Whenever any change shall occur in the Board of Trustees, the legal title to the stock and other property held in trust shall pass to and vest in the successors of said trustees without any formal transfer thereof; but if at any time such formal transfer shall be deemed necessary or advisable it shall be the duty of the Board of Trustees to obtain the same, and it shall be the duty of any retiring trustee, or the administrator or executor of any deceased trustee, to make said transfer.

(11) The trustees shall prepare certificates, which shall show the interest of each beneficiary in said trust, and deliver them to the persons properly entitled thereto. They shall be divided into shares of the par value of $100 each, and shall be known as "Standard Oil Trust certificates," and shall be issued subject to all the terms and conditions of this agreement. The trustees shall have power to agree upon and direct the form and contents of said certificates, and the mode in which they shall be signed, attested and transferred. The certificates shall contain an express stipulation that the holders thereof shall be bound by the terms of

this agreement, and by the by-laws herein provided for.

(12) No certificates shall be issued except for stocks and bonds held in trust, as herein provided for, and the par value of certificates issued by said trustees shall be equal to the par value of the stocks of said Standard Oil Companies, and the appraised value of other bonds and stocks held in trust. The various bonds, stocks and moneys held under said trust shall be held for all parties in interest jointly, and the trust certificates so issued shall be the evidence of the interest held by the several parties in this trust. No duplicate certificates shall be issued by the trustees except upon surrender of the original certificate or certificates for cancellation, or upon satisfactory proof of the loss thereof, and in the latter case they shall require a sufficient bond of indemnity.

(13) The stock of the various Standard Oil Companies held in trust by said trustees shall not be sold, assigned, or transferred by said trustees, or by the beneficiaries, or by both combined, so long as the trust endures. The stocks and bonds of other corporations held by said trustees may be by them exchanged or sold and the proceeds thereof distributd *pro rata* to the holders of trust certificates, or said proceeds may be held and reinvested by said trustees for the purposes and uses of the trust; provided, however, that said trustees may from time to time assign such shares of stock of said Standard Oil Companies as may be necessary to qualify any person or persons chosen or to be chosen as directors and officers of any of said Standard Oil Companies.

(14) It shall be the duty of said trustees to receive and safely to keep all interest and dividends declared and paid upon any of the said bonds, stocks and moneys held by them in trust, and to distribute all moneys received from such sources or from sales of trust property or otherwise by declaring and paying dividends upon the Standard Trust certificates as funds accumulate, which in their judgment are not needed for the uses and expenses of said trust. The trustees shall, however, keep separate accounts and receipts from interest and dividends, and of receipts from sales or transfers of trust property, and in making any distribution of trust funds, in which moneys derived from sales or transfers shall be included, shall render the holders of trust certificates a statement showing what amount of the fund distributed has been derived from sales or transfers. The said trustees may be also authorized and empowered by a vote of a majority in value of holders of trust certificates, whenever stocks or bonds have accumulated in their hands from money purchases thereof, or the stock or bonds held by them have increased in value, or stock dividends shall have been declared by any of the companies whose stocks are held by said trustees, or whenever from any such cause it is deemed advisable so to do, to increase the amount of trust certificates to the extent of such increase or accumulation of values and to divide the same among the persons then owning trust certificates *pro rata.*

(15) It shall be the duty of said trustees to exercise general supervision over the affairs of several Standard Oil Companies, and as far as practicable over the other companies or partnerships, any portion of whose stock is held in said trust. It shall be their duty as stockholders of said companies to elect as directors and officers thereof faithful and competent men. They may elect themselves to such positions when they see fit so to do, and shall endeavor to have the affairs of said companies managed and directed in the manner they may deem most conducive to the best interests of the holders of said trust certificates.

(16) All the powers of the trustees may be exercised by a majority of their number. They may appoint from their own number an executive and other committees. A majority of each committee shall exercise all the powers which the trustees may confer upon such committee.

(17) The trustees may employ and pay all such agents and attorneys as they may deem necessary in the management of said trust.

(18) Each trustee shall be entitled to a salary for his services not exceeding twenty-five thousand dollars per annum, except the president of the board, who may be voted a salary not exceeding thirty thousand dollars per annum, which salaries shall be fixed by said Board of Trustees. All salaries and expenses connected with or growing out of the trust shall be paid by the trustees from the trust fund.

(19) The Board of Trustees shall have its principal office in the city of New York, unless changed by vote of the trustees, at which office, or in some place of safe deposit in said city, the bonds and stocks shall be kept. The trustees shall have power to adopt rules and regulations pertaining to the meetings of the board, the election of officers, and the management of the trust.

(20) The trustees shall render at each annual meeting a statement of the affairs of the trust. If a termination of the trust be agreed upon, as hereinafter provided, or within a reasonable time prior to its termination by lapse of time, the trustees shall furnish to the holders of the trust certificates a true and perfect inventory and appraisement of all stocks and other property held in trust, and a statement of the financial affairs of the various companies whose stocks are held in trust.

(21) The trust shall continue during the lives of the survivors and survivor of the trustees in this agreement named, and for twenty-one years thereafter; provided, however, that if at any time after the expiration of ten years two-thirds of all the holders in value, or if after the expiration of one year 90 per cent of all the holders in value of trust certificates shall, at a meeting of holders of trust certificates called for that purpose, vote to terminate this trust at some time to be by them then and there fixed the said trust shall terminate at the date so fixed. If the holders of trust certificates shall vote to terminate the trust as aforesaid, they may, at the same meeting, or at a subsequent meeting called for that purpose, decide by vote of two-thirds in value of their number the mode in which the affairs of the trust shall be wound up, and whether the trust property shall be distributed or whether part, and if so, what part shall be divided and what part sold, and whether such sales shall be public or private. The trustees, who shall continue to hold their offices for that purpose, shall make the distribution in the mode directed, or, if no mode be agreed upon, by two-thirds in value as

aforesaid, the trustees shall make distribution of the trust property according to law. But said distribution, however made, and whether it be of property, or values, or of both, shall be just and equitable, and such as to insure to each owner of a trust certificate his due proportion of the trust property or the value therof.

(22) If the trust shall be terminated by the expiration of the time for which it is created, the distribution of the trust property shall be directed and made in the mode above provided.

(23) This agreement, together with the registry of certificates, books of accounts, and other books and papers connected with the business of said trust, shall be safely kept at the principal office of said trustees.

(Signatures.)

SUPPLEMENTAL AGREEMENT.

Whereas in and by an agreement dated January 2, 1882, and known as the Standard Trust agreement, the parties thereto did mutually covenant and agree, *inter alia*, as follows, to wit: That corporations to be known as Standard Oil Companies of various States should be formed, and that all of the property, real and personal, assets, and business of each and all of the corporations and limited partnership mentioned or embraced in class first of said agreement should be transferred and vested in the said several Standard Oil Companies; that all of the property, assets, and business in or of each particular State should be transferred to and vested in the Standard Oil Company of that particular State, and the directors and managers of each and all of the several corporations and associations mentioned in class first were authorized and directed to sell, assign, transfer, and convey, and make over to the Standard Oil Company or Companies of the proper State or States, as soon as said corporations were organized and ready to receive the same, all the property, real and personal, assets and business of said corporations or associations; and whereas it is not deemed expedient that all of the companies and associations mentioned should transfer their property to the Standard Oil Companies at the present time, and in case of some companies and associations it may never be deemed expedient that the said transfer should be made, and said companies and associations go out of existence; and whereas it is deemed advisable that a discretionary power should be vested in the trustees as to when such transfer or transfers should take place, if at all.; Now, it is hereby mutually agreed between the parties to the said trust agreement, and as supplementary thereto, that the trustees named in the said agreement and their successors shall have the power and authority to decide what companies shall convey their property as in said agreement contemplated, and when the said sales and transfers shall take place, if at all, and until said trustees shall so decide, each of said companies shall remain in existence, and retain its property and business, and the trustees shall hold the stocks thereof in trust, as in said agreement provided. In the exercise of said discretion the trustees shall act by a majority of their number as provided in said trust agreement. All portions of said trust agreement relating to this subject shall be considered so changed as to be in harmony with this supplemental agreement.

In witness whereof, the said parties have subscribed this agreement this 4th day of January, 1882.

(Duly signed by the same parties.)

BY-LAWS OF THE TRUSTEES OF THE STANDARD OIL TRUST.

ARTICLE I—ELECTION OF TRUSTEES.

Trustees shall be elected by ballot by the owners of trust certificates or their proxies.

Elections of trustees to succeed those already appointed shall be held annually, at which election a sufficient number of trustees shall be elected to fill all vacancies occurring either from expiration of the term of office of any trustee or from any other cause.

All trustees shall be elected to hold their office for three years, except those elected to fill a vacancy arising from any cause except expiration of term, who shall be elected for the balance of the term of the trustee whose place they are elected to fill. Every trustee shall hold his office until his successor is elected.

The annual meeting of the holders of trust certificates and the election of trustees shall be held at the office of the trustees in the city of New York, on the first Wednesday in April of each year, unless otherwise ordered by the trustees, and the said meeting may be adjourned from day to day until its business is completed.

Special meetings of the holders of trust certificates may be called by a majority of all the trustees at such time and place as they may appoint.

Special meetings shall also be called by a majority of the trustees whenever requested so to do, by a request signed by the holders of 10 per cent in value of trust certificates.

The business of such special meetings shall be confined to the objects specified in the notice given therefor.

Notice of the time and place of all meetings of owners of trust certificates shall be given by a personal notice, as far as possible, and shall also be advertised in one of the principal newspapers published in each State in which a Standard Oil Company exists, at least ten days previous to the time of meeting.

At all meetings the owners of trust certificates, who may be registered as such on the books of the trustees, may vote in person or by proxy, and shall have one vote for each and every share of trust certificates standing in their names, but no such owner shall be entitled to vote upon any share which has not stood in his name thirty days prior to the day appointed for the election.

The transfer books may be closed for thirty days immediately preceding the annual election.

A majority of the shares represented at such election shall elect.

At all elections of trustees the Board of Trustees shall be the judges of the qualification of voters; shall prescribe rules and regulations for voting, appoint tellers to direct and count the votes, and cause the result of the election to be entered in full on their minutes.

The trustees may commit their powers in this matter to a committee of their own members.

The election shall be held on a day designated for that purpose, unless prevented by accident, in which case the trustees shall designate another day for the election.

ARTICLE II—BOARD OF TRUSTEES.

The Board of Trustees at their first meeting after their annual election shall elect by ballot from their own number a president, vice-president, treasurer and secretary, and such officers shall hold their offices during the pleasure of the board. Whenever a vacancy occurs in the Board of Trustees more than sixty days prior to the annual meeting for the election of trustees, it shall be the duty of the remaining trustees to call a meeting of the holders of the trust certificates for the purpose of electing a trustee or trustees to fill the vacancy for vacancies.

If any vacancy occurs in the Board of Trustees from any cause within sixty days of the date of the annual meeting for the election of trustees, the vacancy may be filled by a majority of the remaining trustees, or at their option may remain vacant until the annual election.

The board may also appoint an assistant treasurer, assistant secretary, auditor, and such additional officers, agents, executive and other committees as it may deem advisable, and remove the same at its pleasure.

In the absence of the president and vice-president the board may appoint a chairman *pro tempore;* during a prolonged absence or inability of the president or any other officer, the board may appoint substitutes *pro tempore,* and on the death or resignation of the president or other officers, it shall fill the vacancy.

A majority of the trustees shall be required to constitute a quorum for the transaction of business, but less than a quorum may adjourn from time to time and from place to place.

Regular meetings of the Board of Trustees shall be held on the first Wednesday of January, April, July, and October of each year, unless the same shall be a legal holiday, in which event the meeting shall be held on the day following.

ARTICLE III—THE PRESIDENT.

The president shall preside at all meetings of the owners of trust certificates or trustees if present; appoint or remove all officers and agents other than those elected by the owners of trust certificates or the Board of Trustees; call meetings of the Board of Trustees, when requested by a majority of the trustees in writing; sign all certificates of shares, and have a general care, supervision and direction of the affairs of the trust. He shall have power to call meetings of the board from time to time when he shall think proper; to sign certificates of shares in blank and leave them with the treasurer in sufficient numbers to provide for the prompt transfer of shares.

In the event of the death, absence, or inability of the president to perform the duties imposed upon him by these by-laws and the orders of the Board of Trustees, the vice-president may exercise his powers and perform his duties, subject to the control of the Board of Trustees or executive committee.

ARTICLE IV.—THE SECRETARY.

It shall be the duty of the secretary to notify the members thereof of all meetings of the Board of Trustees, when required by the president or by a majority of the trustees in writing; to attend such meetings when practicable, keep true records of the proceedings; attest such records after meeting by his signature; safely keep all documents and papers which shall come into his possession, and truly keep the books and accounts of the trust appertaining to his office, so as at all times to show the real condition of the trust affairs, and shall present statements thereof when required by the board. He shall keep books in which transfers of shares may be made by any owner of trust certificates or his attorney duly constituted in writing; also a share ledger and certificate book; prepare new certificates upon all the transfer of shares and surrender of the old certificates and keep a register of all the certificates issued.

On the day of the annual election the secretary shall furnish for the use of the inspectors an alphabetical list of all the owners of trust certificates who shall have been registered as such for thirty days prior to said election. The assistant secretary shall perform such of the duties of the secretary as may be required of him by the Board of Trustees.

ARTICLE V.—TREASURER.

It shall be the duty of the treasurer to keep and account for all moneys, funds, and property of the trust which shall come into his hands, and he shall render such accounts and present such statements to the trustees and executive committee as may be required of him.

Disbursements shall only be made by him under resolutions of the Board of Trustees, or by the executive committee, or upon vouchers approved by the proper officers.

He shall sign certificates of shares when presented to him after they shall have been signed by the president.

The assistant treasurer shall perform such of the duties of treasurer as may be required of him by the Board of Trustees.

ARTICLE VI.—EXECUTIVE COMMITTEE.

The excutive committee shall possess and exercise by a majority of all its members all the powers and duties of the Board of Trustees, but only when the board shall not be in session. They shall keep a record of all their proceedings, which shall be certified by the secretary under his hand, which record shall be read at the next ensuing meeting of the Board of Trustees. The secretary shall call meetings of this committee on the requisition of the president of the board or of any of its members.

ARTICLE VII.

The fiscal year of this trust shall be the calendar year.

ARTICLE VIII.

These by-laws may be altered, amended, or repealed at any meeting of the owners of trust certificates by a vote of a majority in value of all the owners represented, provided, however, that all by-laws relative to formal meetings and formal duties of the trustees and officers may be altered by the Board of Trustees.

REVISED CHARTER OF THE STANDARD OIL COMPANY OF NEW JERSEY.

Resolved, That it is advisable to alter the charter of this company to read as below stated, and that a meeting of the stockholders be called to meet at the principal office of the company in Bayonne, New Jersey, on the 14th day of June, 1899, at 11 a. m., to take action thereon, notice of such meeting to be signed by the president and secretary, and given to each stockholder in person, or mailed to his proper postoffice address, at least ten days previous to the time of meeting, as provided by the by-law.

First, The name of the corporation is Standard Oil Company.

Second, The location of the principal office in the State of New Jersey is at the company's refinery in the city of Bayonne and county of Hudson. The name of the agent therein and in charge thereof, and upon whom process against this company may be served, is J. H. Alexander.

Third, The objects for which this company is formed are: To do all kinds of mining, manufacturing, and trading business; transporting goods and merchandise by land or water in any manner; to buy, sell, lease, and improve lands; build houses, structures, vessels, cars, wharves, docks and piers; to lay and operate pipe lines; to erect and operate telegraph and telephone lines and lines for conducting electricity; to enter into and carry out contracts of every kind pertaining to its business; to acquire, use, sell, and grant licenses under patent rights; to purchase or otherwise acquire, hold, sell, assign, and transfer shares of capital stock and bonds or other evidences of indebtedness of corporations, and to exercise all the privileges of ownership, including voting upon the stocks so held; to carry on its business and have officers and agencies therefor in all parts of the world, and to hold, purchase, mortgage and convey real estate and personal property outside the State of New Jersey.

Fourth, The total authorized stock of the corporation is one hundred and ten million dollars, divided into one million and one hundred thousand shares of the par value of one hundred dollars each. Of said stock the one hundred thousand shares now issued and existing shall be preferred stock, and the increase of one million shares shall be common stock. Said preferred stock shall entitle the holder thereof to receive out of the net earnings a dividend of and not exceeding one and one-half per centum quarterly before any dividend shall be paid on the common stock. Common stock may, at the discretion of the company, be issued in exchange for preferred stock, and all preferred stock so received by the company shall be canceled. Common stock may also be issued in payment for such property as the company has authority to purchase. Holders of preferred and of common stocks shall have like voting power.

Fifth, The names and postoffice addresses of the incorporators and the number of shares subscribed for by each shall remain as set forth in the original certificate of incorporation.

Sixth. The duration of the corporation shall be unlimited.

Seventh. The corporation may use and apply its surplus earnings, or accumulative profits authorized by law to be reserved, to the purchase or acquisition of property, and to the purchase or acquisition of its own capital stock from time to time, to such an extent and in such manner and upon such terms as its Board of Directors shall determine; and neither the property nor the capital stock so purchased or acquired, nor any of its capital stock taken in payments or satisfaction of any debt due to the corporation, shall be regarded as profits for the purpose of declaration or payment of dividends, unless otherwise determined by a majority of the Board of Directors or a majority of the stockholders.

The corporation, in its by-laws, may prescribe the number necessary to constitute a quorum of the Board of Directors, which may be less than a majority of the whole number.

The number of directors at any time may be increased or diminished by vote of the Board of Directors, and in case of any such increase the Board of Directors will have power to elect such additional directors, to hold office until the next meeting of stockholders, or until their successors shall be elected.

The Board of Directors shall have power to make, alter, amend, and rescind the by-laws of the corporation, to fix the amount to be reserved as working capital, to authorize and to cause to be executed mortgages and liens upon the real and personal property of the corporation, and from time to time to sell, assign, transfer, or otherwise dispose of any or all of the property of the corporation; but no such sale of all of the property shall be made except pursuant to the votes of at least two-thirds of the Board of Directors.

The Board of Directors, by resolution passed by a majority of the whole board, may designate three or more directors to constitute an executive committee, which committee, to the extent provided in said resolution or in the by-laws of the corporation, shall have, and may exercise, the power of the Board of Directors in the management of the business and affairs of the corporation, and shall have power to authorize the seal of the corporation to be affixed to all papers which may require it.

The Board of Directors from time to time shall determine whether and to what extent, and at what times

and places, and under what conditions and regulations, the accounts and books of the corporation, or any of them, shall be open to the inspection of the stockholders; and no stockholder shall have any right of inspecting any account or book or document of the corporation except as conferred by statute or authorized by the Board of Directors or by a resolution of the stockholders.

The Board of Directors shall have power to hold its meetings, to have one or more offices, and to keep the books of the corporation (except the stock and transfer books) outside of the State, at such places as may be from time to time designated by them.

I certify that the above resolution was adopted by the Board of Directors of the Standard Oil Company at a meeting held on the 26th day of May, A. D. 1899, a majority of directors being present and voting in favor therof. Witness the seal of said corporation.

(Corporate Seal.) L. D. CLARKE,
Secretary.

BY-LAWS OF THE STANDARD OIL COMPANY OF NEW JERSEY.

ARTICLE I.—MEETING OF STOCKHOLDERS.

The annual meeting of stockholders and the election of directors shall be held at the office of the company in Bayonne, New Jersey, on the second Tuesday in January in each year, and said meeting may be adjourned from day to day until its business is completed.

Special meetings of the stockholders may be called by a majority of all the directors at such times and places as they may appoint.

The directors shall also call a meeting of stockholders within ten days after a written request so to do signed by a majority of the stockholders.

The business of such special meetings shall be confined to the subject specified in the notice therefor.

Notice of the time and place of all meetings of stockholders shall be signed by the secretary, and be given to each stockholder in person or be mailed to his proper postoffice address at least ten days previous to the time of meeting.

At all meetings stockholders who may be registered as such on the books of the company may vote in person, by agent, or by proxy, and shall have one vote for each and every share of stock standing in their names, but no shareholder shall be entitled to vote upon any stock which has not stood in his name ten days prior to the day appointed for the election.

The transfer books may be closed for ten days previous to the annual election.

At all elections the directors shall be the judges of the qualifications of voters, shall prescribe rules and regulations for voting, appoint inspectors to collect and count the votes, and cause the result of the election to be entered in full on their minutes.

The board may commit its powers in this matter to a committee of its own members.

The election shall be held on the day designated for that purpose unless prevented by accident, in which case the board shall designate another day for the election.

A majority of the stockholders present at any meeting shall constitute a quorum.

ARTICLE II.—BOARD OF DIRECTORS.

The Board of Directors shall consist of thirteen persons, who shall hold their office one year and until their successors are elected.

The Board of Directors at their first meeting after every annual election shall elect a president, four vice presidents, a treasurer, and secretary, and such officers shall hold their offices during the pleasure of the board. One person may be both secretary and treasurer.

In case of any vacancy in the Board of Directors by death, resignation, or otherwise, the board shall have the power to fill for the unexpired term such vacancy by ballot.

The board may also appoint one assistant treasurer, one assistant secretary, and such additional officers and agents as they may deem advisable, and remove the same at their pleasure.

In the absence of the president and vice-president, they may appoint a chairman *pro tempore.*

During a prolonged absence or inability of the president or any other officer, they may appoint substitutes *pro tempore,* and on the death or resignation of the president, or other officer, they shall fill the vacancy.

Five of the directors shall be required to constitute a quorum for the transaction of business; but less than a quorum may adjourn from time to time and from place to place.

The Board of Directors may at their option hold their meeting at any place outside of the State.

Dividends upon the capital stock of the company, when earned, shall be declared by the Board of Directors on the first Tuesday of February, May, August and November in each year, the same to be payable on the 15th of the succeeding month. The board shall have power to fix the amount to be reserved as working capital.

ARTICLE III.—PRESIDENT.

The president shall preside at all meetings of the stockholders or directors, if present; sign all certificates of stock and have a general care, supervision and direction of the affairs of the company. He shall have power to call meetings of the board from time to time when he shall think proper, or when requested by a majority of the board.

In the event of the death, absence, or inability of the president to perform any duties imposed upon him by these by-laws and the order of the Board of Directors, the vice-president may exercise his powers and perform his duties, subject to the control of the Board of Directors.

ARTICLE IV.—SECRETARY.

It shall be the duty of the secretary to notify the members thereof of all meetings of the Board of Directors when required by the president, or when requested by a majority of the directors in writing; to attend such

meetings when practicable; keep true records of the votes at elections and all other proceedings; attest such records after every meeting by his signature; safely keep all documents and papers which shall come into his possession, and truly keep the books and accounts of the company appertaining to his office; and shall present statements thereof when required by the board. He shall keep books upon which transfer of stock may be made by any stockholder, or his attorney duly constituted in writing. He shall prepare new certificates upon the transfer of shares and surrender of the old certificates and keep a register of all certificates issued. The assistant secretary shall perform such of these duties as the directors may require.

ARTICLE V.—TREASURER.

It shall be the duty of the treasurer to keep and account for all monies, funds and property of the company which shall come into his hands, and he shall render such accounts and present such statements to the directors as may be required of him. He shall deposit all funds of the company which may come into his hands in such bank or banks as the directors may designate; he shall keep his bank account in the name of the company, and shall exhibit his books and accounts to any director upon application at the office during ordinary business hours; he shall indorse for collection the bills, notes, checks and other negotiable instruments received by the company he shall sign all bills, notes, checks and other negotiable instruments of the company and shall pay out money on the business as the corporation may require, taking proper vouchers therefor, provided, however, that the directors shall have power by resolution to delegate any of the duties of the treasurer to other officers, and to provide by what officers all bills, notes, checks, vouchers, orders, or other instruments shall be signed. The assistant secretary shall perform such of these duties as the directors may require.

ARTICLE VI.—CORPORATE SEAL.

A corporate seal shall be prepared and shall be kept by the secretary in the office of the company.

The impression of the seal may be made and attested by either the secretary or an assistant secretary for the authentication of contracts and other papers requiring the seal and bearing the signature of the president or one of the vice-presidents.

ARTICLE VII.—FISCAL YEAR.

The fiscal year of this corporation shall be the calendar year.

ARTICLE VIII.—AMENDMENTS.

These by-laws may be altered or amended by a vote of the directors at any meeting.

The first general office of the Standard Oil Company was located on the corner of Euclid avenue and Broadway, Cleveland, Ohio. Their second office was located at 18 Broadway, New York City. The present general headquarters of the Standard Oil and affiliated companies are in the Standard Oil Building, 26 Broadway, New York.

The Standard Oil Company, of New York, of which William Rockefeller is president, owns the granite building at 26 Broadway, facing Bowling Green. The building is fifteen stories high, 209 feet from Broadway, through to New street, contains four acres of floor space, and cost one and one-half millions of dollars. Its architecture is severe but imposing, the interior rich without ornament, and all the rooms large and perfectly lighted and ventilated.

This building is the headquarters of the American petroleum industry, being occupied only by the company to which it belongs and by companies engaged in different branches of the same industry. Here may be found the offices of several producing companies which are engaged in drilling wells and pumping crude petroleum from the bowels of the earth in various parts of the States of New York, Pennsylvania, West Virginia, Ohio, Indiana, Kentucky, Kansas, Colorado, California, Texas and Indian Territory. Here also are the offices of the different pipe line companies, which receive the crude products from the wells, and convey it in under ground pipes to the great refineries in various interior cities and at the seaboard. The company which builds, owns and operates the peculiar boiler-shaped cars which are used to convey refined oil to all parts of the United States has its home in this building; and likewise the companies which carry oil in bulk across the ocean and deposit it in great tanks at various sea ports, to be distributed by tank cars on British and Continental railways. The trans-Atlantic steamships carry from 800,000 to 1,000,000 gallons, which is loaded or discharged in from seven to fifteen hours. They make seven or eight round trips a year. Side by side, with these are found the offices of companies engaged in manufacturing the scores of useful products derived from petroleum, as well as the materials used in such manufacture, and the barrels, tin cans and cases, in which a portion of these products is marketed.

These companies are all separate, but their interests are identified by reason of identity of stockholders.

The business carried on through these agencies is the largest and most successful in this age of large industries, and is due to the energy and far-sightedness of a comparatively few men. The united investments to-day aggregate over $100,000,000. Every device which ingenuity could invent, experience suggest and capital obtain, has been utilized for enlarging the quantity and improving the quality of the products manufactured, and for cheapening the cost of their manufacture and transportation, with the result that the public are supplied, not only with light, but with many new, necessary and useful articles derived from petroleum at a cost which is almost nominal. In its cooperage department the company uses yearly 100,000,000 feet of oak timber, from twenty states; and at Oswego, N. Y., it has the largest lumber mill in the world, cutting yearly over 100,000,000 feet of white pine into material for oil sent out in cans.

This industry stands distinct and separate from many large industries, in some respects copied after it, in the fact that it has refrained from stock-jobbing,

and, instead of restricting production and increasing prices, it has pursued exactly the opposite policy, and striven by cheapening its products to increase the demand and widen the market for them. A less cost and a larger market is the theory upon which this business has always been conducted, and its great success proves this to be a much wiser business policy than the theory of restricted production and increased prices, which has ruined so many promising industries.

The Standard Oil Trust was dissolved in 1892. The property held by the trust was distributed among twenty different corporations in various States and localities. In each of these corporations the former nine trustees, as individuals acting together, held control, so that the same unity of management of the twenty separate companies was maintained as had existed under the one trust, which did not go into effect until June, 1898.

THE STANDARD OIL COMPANY OF NEW JERSEY IS THE HEAD OF THE STANDARD OIL COMPANY OF NEW YORK.

This Company and its allied branches produce and manufactures 90 per cent, of the total output of refined oil in the United States; owns wells in Pennsylvania, New York, Ohio, Indiana, West Virginia, California, Kansas, Kentucky, Colorado, Texas, Wyoming, Utah and Indian Territory, and owns refineries in all the leading cities in the North and in the South. It also has its own pipe lines connected with all the oil fields in the United States, buys 90 per cent. of all the oil produced in the United States, and stores it in large iron tanks for future use or delivers it by pipe line direct to its refineries; then by trunk line it carries the oil direct to tidewater. The business is very extensive, both at home and abroad. The Standard Oil Trust was capitalized at $10,000,000, the holders of which had only a beneficiency interest in other companies controlled by the Standard Oil Trust, but in June, 1899, holders of these certificates were given in exchange for their securities share for share, new common stock of the Standard Oil Company of New Jersey, capitalized at $110,000,000, which succeeded to the properties formerly held by liquidating trustees. The new stock represents a direct ownership in the properties of the Standard Oil Company. This change was due to a *desire* of the Standard Oil people to give up the "Trust" feature of their business, in accordance with the anti-trust laws.

The Standard Oil Company of New Jersey is the financial head of all the Standard Oil and affiliated companies. The stock certificates are issued by the Standard Oil Company of New Jersey, which governs the *evener* system, adopted by this company to share equally the profits and losses from the several allied companies whereby the holders of stock in the refineries, pipe lines and the producing companies were given share for share in the Standard Oil Company of New Jersey, and share equally in the value of all the stock and receive dividends per ratio on the number of shares held. There is probably no concern in the world which is the subject of so much suspicion, and psychological, as well as industrial, antagonism, as the Standard Oil Company. People who know nothing whatever of the oil business, of the industry, history, methods or results of the company, feel perfectly competent to pass judgment, always, of course, against the Standard. It has been regarded as the evil genius which is the cause of all the bad and none of the good in the oil industry. The lawsuits, legislative investigations, and practically all anti-trust schemes and literature have been directed against the Standard Oil Company as the "Monopoly" of the refining, transporting and producing of petroleum oil. Following is a true and full list of all the investigations, suits-at-law and the evidence in full as sworn to, and the names of the witnesses and a full history of the proceedings as brought out at the Hepburn Investigation in the State of New York, in 1889:

House of Representatives, United States Congress, House Reports, First Session, Fiftieth Congress, 1887-1888. Volume IX., Report on Investigation of Trusts, "Standard Oil Trust."

The Standard Oil Trust, by the Committee on Manufactures, House of Representatives, Fiftieth Congress, First Session, House Reports, Volume No. IX.

Standard Oil Trust Agreement, House Documents, Volume IXIII., No. 476, Part I., House Reports United States Congress.

Industrial Commission, United States Congress. Reports Volume I., Trusts, Fifty-sixth Congress, First Session, 1899-1900. Volume I., Page 1221.

HISTORY OF STANDARD OIL COMBINATIONS.

ORGANIZATION AND PURPOSES.

Mr. Lewis Emery quotes part of the testimony of Mr. Henry M. Flagler before the Committee on Manufactures of the House of Representatives in 1888. This shows that in 1870 the firm of Rockefeller, Andrews & Flagler was formed to succeed the separate firms of Rockefeller & Co. and Rockefeller & Andrews. The capacity of the new firm was about 600 barrels of crude oil per day. This firm in the same year was reorganized under the name of the Standard Oil Company of Ohio, with a capital of $1,000,000.

John D. Rockefeller made affidavit concerning the growth of the Standard Oil Company as follows:

"1. Q. What was the first combination in which you were interested of different establishments in the oil industry. A. The first combination of different establishments in the oil industry in which I was interested was the union of William Rockefeller & Co., Rockefeller & Andrews, Rockefeller & Co., S. V. Harkness and H. M. Flagler, about the year 1867.

"2. Q. What were the causes leading to its formation? A. The cause leading to its formation was the

desire to unite our skill and capital in order to carry on a business of some magnitude and importance in place of the small business that each separately had theretofore carried on. As time elapsed and the possibilities of the business became apparent we found further capital to be necessary, obtained the required persons and capital, and organized the Standard Oil Company with a capital of $1,000,000. Later we found more capital could be utilized and found persons with capital to interest themselves with us, and increased our capital to $3,500,000. As the business grew, and markets were obtained at home and abroad, more persons and capital were added to the business and new corporate agencies were obtained or organized, the object being always the same, to extend our business by furnishing the best and cheapest products."

It appears that the Standard Oil Company was reorganized in 1872 with a capital of $2,500,000, which was again increased to $3,500,000 in 1875, which remains the amount of capital of this particular company to the present time.

GROWTH OF MONOPOLY DURING THE SEVENTIES.

Beginning early in the seventies the men interested in this company began to associate themselves with other refiners and to extend their business with greater rapidity. They also secured control of the pipe lines of Pennsylvania, a process which is more fully described under a separate heading. Numerous refineries were either driven out of business altogether, or were in some way led to affiliate with the Standard Oil Company. Certain witnesses attribute this growth of control over the refining business partly to the ownership of the pipe lines, but the chief reason assigned by many opponents of the combination is railroad favoritism, a detailed history of which is given later on.

Mr. Emery specially refers to previously existing testimony to show the manner in which the Standard Oil Company, through the influence of railway discriminations, grew from a small concern in 1870 to a practical monopoly of the entire oil refining business in 1879. In 1870 there were approximately 250 refineries, most of them located in the oil regions. The Standard Oil Company then owned about 4 per cent of the refining capacity of the country. In 1879 Mr. H. H. Rogers and Mr. Jabez A. Bostwick, members of the Standard Oil Company, testified before the Hepburn committee that that company, or the combination which it represented, owned or controlled 90 or 95 per cent of the refinining industry in America. There was a time, Mr. Emery declares, when he did not know of a single independent refiner.

The witness himself was interested in the Octave Oil Company at Titusville, having a capacity of about 800 barrels daily. This company was invited to join the Standard Oil Company, but refused to do so. In the latter part of 1873 it was forced to sell out to that company, having been unable to maintain its business. The refinery cost $85,000, and sold for $45,000. It was run for two or three years by the Standard Oil Company, but was finally dismantled.

In 1880 the witness built a new refinery in Philadelphia at the suggestion of the Pennsylvania Railroad, but was again driven out of business by discriminations, especially by the inability to obtain cars to ship oil from his wells to his refinery.

Mr. S. C. T. Dodd, in reply to a schedule of questions, made the following statement as to the process of growth of the Standard Oil combination:

"About the year 1872 the condition of the refined oil business was disastrous, and failures were of constant occurrence. Leading refiners began to combine for the purpose of making the business successful. The combination was by means of purchase of stocks and interests of various companies, and, until 1882, the combination was solely by stock ownership in the hands of a limited number of individuals, who controlled the corporations as agencies in a common sense business. In 1882 these owners entered into the trust agreement. The companies whose stock they owned, in whole or in part, appear in the same agreement. They were not then competing companies. The individuals named as trustees controlled them by virtue of absolute ownership of a majority of their stocks. When the trust was dissolved, in 1892, the same fact existed. The individuals then trustees continued to control the companies by virtue of absolute ownership of a majority of their stocks."

Mr. John D. Rockefeller, in answer to interrogatories submitted by the commission, made affidavit as to the growth of the Standard combination. He attributed the extension of its business, not to crushing of competitors, but to the need of additional capital in order to employ the most effctive methods of manufacture and transportation. From time to time it was discovered that existing methods were unsatisfactory, and larger investments had to be made for improved methods. Thus to perfect the pipe line system required some $50,000,000 of capital. This could not be obtained without industrial combination.

ORGANIZATION OF TRUST, 1882.

Up to 1882 there was no formal consolidation of the numerous refining and pipe line companies which were controlled by the officers of the Standard Oil Company or which were worked in harmony with it. At this time the Standard Oil Trust was formed, being the first organization to take on that form. The various separate organizations placed the control of their stock of property in the hands of trustees, who were thus able to control completely the operation of all the concerns.

Frank S. Monnett, Attorney-General of Ohio, testifies that there were altogether 39 companies which entered the Standard Oil Trust, 14 of which transferred all their stock and the remainder a controlling interest to the trustees. Besides this a large number of individual owners and firms entered the trust. There were nine trustees, holding office for three years, with one-third retiring annually.

The trust certificates were issued in amounts equal to the appraised value of each plant transferred. According to Mr. Monnett, there was no attempt to inflate the valuation. Each company agreed that no stock should thereafter be issued excepting to the trustees.

Mr. Emery, on the other hand, testifies, but without submitting detailed evidence, that refineries and other establishments were taken into the trust at rates greatly in excess of their actual value, the chief consideration being the power of monopoly which was thereby acquired.

Mr. Monnett testifies that the trustees themselves had 466,280 of the original 972,500 trust certificates. They also hold more than half of the shares of the present constituent corporations, while Mr. Rockefeller holds more than half of the number held by the trustees.

EXISTING ORGANIZATION.

1. Reorganization into separate companies, 1892.——The Standard Oil Trust, having been held illegal in various States, was dissolved in 1892, the separate establishments and plants being reorganized into twenty constituent companies having a capitalization of $102,233,700. Thus certificates when surrendered were replaced by a proportion of the shares of each company, properly divided.

The following form of transfer was used to give holders of trust certificates proportionate shares in the capital stock of each of the constituent companies established at the time when the trust form of organization was abandoned:

Know all men by these presents:

That we, John D. Rockefeller, Henry M. Flagler, William Rockefeller, John D. Archbold, Benjamin Brewster, Henry H. Rogers, Wesley H. Tilford and O. B. Jennings, trustees for winding up the Standard Oil Trust, by W. H. Tilford, our attorney in fact, and John D. Rockefeller, of New York, do hereby constitute and appoint John Bensinger, of New York City, our true and lawful attorney for the purposes following, to wit:

Whereas, John D. Rockefeller has placed in the hands of said attorney assignment No. A 365 for $\frac{256854}{972500}$ of the amount of corporate shares held by said trustees on the first day of July, 1892, in each of the companies whose stocks were so held.

Now the said attorney is hereby authorized to secure from each of said companies transfer upon their corporate books of said stock and stock certificates for whole shares, and scrip for fractional shares thereof, and when the said certificates and scrip are received from all the companies referred to the said attorney shall deliver the same to John D. Rockefeller, and the said assignment of No. A 365 shall at the same time be delivered to the said trustees.

And the said attorney hereby agrees to obtain the said certificates and scrip and to deliver the same and the said assignments as above specified.

(Signed in print.) JOHN D. ROCKEFELLER.
HENRY M. FLAGLER,
WILLIAM ROCKEFELLER.
JOHN D. ARCHBOLD.
BENJAMIN BREWSTER.
HENRY H. ROGERS.
O. B. JENNINGS.
(Signed in ink.) WESLEY H. TILFORD.
W. H. TILFORD, *Attorney in Fact.*
JOHN D. ROCKEFELLER, per GEO. D. ROGERS.
JOHN BENSINGER.

Thus, Mr. Monnett testifies, the Standard Oil Company has several constituent corporations in Ohio. The Ohio Oil Company leases oil lands and purchases crude oil. The Buckeye Pipe Line Company' in conjunction with other pipe line companies owned by the Standard, makes a complete system which transports crude oil to the various refineries in Ohio and adjoining States. The Solar Refining Company engages in refining. The refined product is transported by the Union Tank Line Company, which has great advantages in the use of tank car and terminal facilities. It is by this control of the means of transportation that the Standard secures its monopoly.

Mr. Monnett further states that the Standard Oil Company, of Ohio, on August 5, 1891, sold its tank cars to the Union Tank Line Company for $3,500,000, most of which sum it transferred in 1892 to the Standard Oil Trust for distribution among the holders of trust certificates. This was in defiance of the order of the Court, of 1892, prohibiting it from further relations with the Standard Oil Trust. Since then this company has paid no dividends, although it still pays salaries. Its accumulated funds have been apparently charged off for depreciation and profit and loss. Its officers refused to submit its books to the Courts, and are believed to have burned a large number of them.

2. Capitalization.—Mr. Dodd, in reply to a schedule of questions, stated that the property of the various companies entering the Standard Oil Trust, was valued at $75,000,000 in 1882. In 1892 the value was estimated at $121,631,312. Perhaps 50 per cent of this additional value had come from profits invested, the remainder from additional capital subscribed. Up to 1896 about the same proportion of profits continued to be applied to improvements, but since that time the profits have been divided, as is seen from the higher rate of dividends. An average of 5.77 per cent has been allowed for annual depreciation.

The inventory referred to by Mr. Dodd is as follows:

COMPANIES	Appraised Value	Capitalization
Anglo-American Oil Co., Ltd....	$ 6,913,639 49	$ 5,000,000
Atlantic Refining Co.....	8,631,376 67	5,000,000
Buckeye Pipe Line Co.....	7,941,038 15	10,000,000
Eureka Pipe Line Co.....	1,547,055 16	5,000,000
Forest Oil Co.....	3,528,813 11	5,500,000
Indiana Pipe Line Co.....	2,014,053 91	1,000,000
National Transit Co.....	25,796,712 97	25,455,200
New York Transit Co.....	4,999,300 00	5,000,000
Northern Pipe Line Co.....	707,067 00	1,000,000
Northwestern Ohio Nat. Gas Co..	1,396,760 00	3,278,500
Ohio Oil Co.....	8,260,378 04	2,000,000
Solar Refining Co.....	711,793 87	500,000
Southern Pipe Line Co.....	3,279,018 28	5,000,000
South Penn Oil Co.....	3,021,654 87	2,500,000
Standard Oil Co., Indiana.....	1,038,518 61	1,000,000
Standard Oil Co., Kentucky....	3,604,800 78	1,000,000
Standard Oil Co., New Jersey...	14,983,943 30	10,000,000
Standard Oil Co., New York....	16,772,186 29	7,000,000
Standard Oil Co., Ohio.....	3,426,014 72	3,500,000
Union Tank Line Co.....	3,057,187 41	3,500,000
	121,631,312 63	.....
Capitalization 20 corporations..	102,233,700 00	.....
Excess.....	19,397,612 63	.....

3. Existing relations of constituent companies and trust.—Mr. John D. Archbold testified that, although the Standard Oil Trust was dissolved in 1892, the men who were the former trustees have held a majority of the stock in all the different companies which made up the trust, so that they work together as harmoniously as before. The latest movement on the part of the combination, in order to secure more complete unity and to provide for the claims of small holders of trust certificates, is the organization of a New Jersey corporation entitled the Standard Oil Company. This corporation has a capital of $100,000,000 of common stock and $10,000,000 of preferred stock, and is authorized to own the stock of any of the different corporations connected with the Standard Oil Company and to buy from all parties who own such stock whenever they desire to sell.

Mr. Monnett testifies that a man could not have his trust certificates reconverted into stock of the several constituent companies, and get out of the trust, unless he held $66,000 worth. This enables the trustees and a few others holding large amounts to exchange their certificates for stock and thus to practically control all the constituent companies, while smaller holders retain their certificates and are still receiving dividends upon them. Altogether only 54 per cent of the trust certificates were converted into stock. Holders of fractional shares in the separate companies receive no dividends.

Replying to this testimony Mr. Archbold states that the replacement of trust certificates by proportionate shares of stock in the separate companies has been going on steadily, and that only a small number of trust certificates are still outstanding. He admits that the dividends when declared are at a certain percentage upon these outstanding certificates and a properly adjusted rate upon the capital stock of the different companies. The rate of dividend may be considered as if it were entirely upon the trust certificates at their former full amount.

The prices at which Standard stock is quoted on the market are still based on the old trust certificates, since practically the equitable interest in each of the separate companies corresponding to a share in the trust certificates is of the same value. If the purchaser should buy trust certificates on the market and take them to the company it would give him either a proportion of the shares of each of the separate corporations or an equal amount of the stock of the newly formed corporation, the Standard Oil Company of New Jersey.

The Standard Oil Company has always kept its stocks and certificates off from the Stock Exchange, and there has been very little speculation in them. The officers and directors have bought and sold stocks only to a very limited extent, and usually for the purpose of increasing their holdings. Mr. Archbold himself has bought and sold only 100 shares during ten years.

Mr. H. H. Rogers states that when the Standard Oil Trust was dissolved those holders of trust certificates whose holdings were small received only fractional shares in the various separate companies, and on these shares they receive no dividends. The denominator of these fractional shares is about 975,000 and the numerator is often very small, so that the interest is so trifling that it would be impossible to pay a dividend. Nevertheless the Standard Oil Company is prepared to do whatever is fair regarding such fractional shares.

DIVIDENDS AND PROFITS OF COMBINATION.

According to Mr. George Rice, the Standard Oil Trust from 1882 to 1892 paid dividends equal to more than double its entire capitalization in 1888. Since 1892, when the trust was nominally dissolved, thirty quarterly dividends of 3 per cent have been paid, and 77 per cent in special dividends since 1895, making a total of 167 per cent on its capitalization, or in all $170,730,279. Aside from these dividends the company has invested millions of dollars of its net earnings in producing oil property.

Mr. Monnett's testimony confirms the above generally. He speaks specifically of extra dividends of 5 per cent in 1895, 19 per cent in 1896, 12 per cent in 1897, and 4 per cent in 1898. He adds that, judging from the recent rates of dividends, a prominent judge has said that the present value of trust certificates, whose face is $97,250,000, would be $486,250,000.

Other witnesses also refer to the high value of Standard stocks as showing enormous profits. Mr. Archbold states that on this point that the price prevailing at the time of his tesimony, $465 per share, was the highest ever known.

Mr. Dodd submitted the following statement, showing all the dividends declared by the combination since 1882. In addition to these a stock dividend of 20 per cent was declared in 1887. He stated that no distinction had been made in the distribution of profits between the former owners of closed and dismantled plants and others.

	Per cent.		Per cent.
1882	5.25	1891	12
1883	6	1892	12.21
1884	6	1893	12
1885	10.50	1894	12
1886	10	1895	17
1887	10	1896	31
1888	11.50	1897	33
1889	12	1898	30
1890	12		

Mr. P. C. Boyle believes that the profits of the Standard Oil Company have not been reduced by the depression in the price of crude oil. The capital stock of the company before its reorganization several years ago was $100,000,000, and the witness has heard that it was worth $500 per share. The stock of the Tidewater Pipe Line Company, which has a capital of $10,000,000, was quoted at $2,000 per share. There may be agreements between this company and the Standard, but it is not absolutely under the Standard's control.

OHIO SUITS AGAINST STANDARD OIL COMPANY.

1. General description.—Mr. Monnett, the Attorney-General of Ohio, testifies that suit was brought against the Standard Oil Company of Ohio in 1891, and a decree was secured in 1892 directing it to withdraw from the Standard Oil Trust. In November, 1897, the Attorney-General summoned the same company before

the Court on the ground that it had not withdrawn it in good faith, but simply modified the form of organization. On the basis of answers to interrogatories submitted to Mr. John D. Rockefeller, information was secured which led to filing suits against all the constituent companies of the original trust which were then doing business in Ohio—the Buckeye Pipe Line Company, Ohio Oil Company, Solar Refining Company and Standard Oil Company of Ohio. There were four causes of action: (1) As against public policy; (2) for confederating and attempting to evade the decree of 1892; (3) for violation of the Ohio anti-trust act of 1898; (4) against the Buckeye Pipe Line Company for transacting telegraph business as a common carrier, which was ultra vires. This company was found to be exchanging business with the Western Union Telegraph Company.

The present status of these suits (at the time of Mr. Monnett's testimony) is as follows: The officers of the Standard Oil Company of Ohio are before the Court on the charge of contempt for refusing to produce their books. They are also held for violation of the original decree of the Court, and it may inflict any fine it sees fit. An independent suit has been brought for taking away the charter of this company, and another suit for the same purpose is pending against the Buckeye Pipe Line Company, in which the witnesses are also before the Court for contempt in refusing to answer questions. If the existing suits are won, the monopoly of the Standard Oil Company in the Ohio field, which depends on its control of the pipe lines, will be destroyed.

Mr. Archbold, in replying to the testimony of Mr. Monnett generally, points out that the attacks upon the Standard Oil Company in the Courts of Ohio were injurious to the interests of the State, since that company, through the various corporations in which it is interested in Ohio, pays about $250,000 taxes yearly and distributes $3,250,000 as wages to 4,700 employees.

2. Production of books.—Mr. Monnett testifies, in further detail, that in these suits the Supreme Court of Ohio has ordered the Standard Oil Company of Ohio to produce its books and records, and it has refused to do so, relying on its constitutional rights. The question as to the power to compel it to produce its books is still pending. According to Mr. Monnett, testimony before that Court shows that a large number of books and papers were burned two or three days after the order requiring the production of books was made. The evidence of John McNirney on this subject is quoted in full. He was an employee in the car shops of the Standard Oil Company at Cleveland, and assisted in lowering certain boxes which he believes to have contained books from the office of the Standard Oil Company. That same day and the following Monday he assisted in burning a large number of books, taken from such boxes in the car shop furnaces. The books were large books, apparently ledgers, and many loose papers and letter-press books were also burned. Altogether nine chests and six sacks of materials were burned.

Mr. Archbold denies absolutely the fact of such burning of books by the Standard Oil Company. He states that at the time of the original inquiry on the subject the company offered to produce every employee who could have any knowledge on the subject, each of whom could have denied the statement. The Attorney-General refused to have them sworn at the time, although he knew that the secretary of the Standard Oil Company of Ohio had made an affidavit that the books were in his possession.

3. Alleged attempts at bribery.—Mr. Monnett refers to the alleged attempt of the Standard Oil Company to bribe himself, as Attorney-General of Ohio, and offers to submit papers in the case, but presents no further evidence.

Mr. Archbold testifies that affidavits have been filed with the Supreme Court of the State of Ohio denying specifically all of Mr. Monnett's charges of attempted bribery, and asking the Court to appoint a commissioner to investigate the charges. The Court has not acted upon the subject, but the company is anxious that it should do so.

I. PIPE LINES—CONTROL BY COMBINATION

EARLY HISTORY.

Mr. Boyle gives a somewhat detailed history of the development of pipe line transportation in the oil business.

The first successful pipe lines were established in 1864 from Pithole to the Miller farm. Others were soon constructed in the same district. These were usually short, scarcely over five miles in length, and at first did not even connect directly with the wells themselves, although this practice was soon established. Numerous lines soon grew up in different parts of the oil region, but the first more extended systems date from 1869, when the Mutual Pipe Line was laid more or less throughout Clarion county. Vandergrift & Forman later established a system through Butler county, which became the nucleus of what is now known as the United Pipe Line System.

The original pipe lines were only transporters of oil, but the nature of their work soon led them to purchase oil, although at first it was not in the name of the company itself. At times there were rumors casting doubt on the integrity and solvency of some of the pipe lines. The prices which purchasers of oil were willing to pay to the pipe lines varied accordingly, since they were sometimes in doubt as to whether the oil would be forthcoming. It was quite common in those days for shortages to be discovered in the amount of the oil held by the pipe lines as compared with the amount which they owed to certificate holders. The lines would use oil or sell it and expect to make up the shortage by purchase later on. Mr. Boyle quotes from a published statement of the Atlantic Pipe Line in 1876, acknowledging a shortage of 6,000,000 barrels, but stating that 15,000,000 barrels had been purchased to cover it.

Mr. Emery also makes a brief statement of the early history of pipe lines. He states that the first attempt to combine separate pipe lines into a more complex system was made by William H. Abbott and Henry Harley, beginning about 1866. By 1869 they had a

capital of nearly $2,000,000, and 500 miles of pipe centering in the Miller farm. The concern was then known as the Pennsylvania Transportation Company.

ABSORPTION OF COMPETING LINES BY STANDARD.

1. History.—Several witnesses describe the process by which the Standard Oil Company gradually secured control of the various pipe lines throughout the oil region. The opponents of the trust attribute the success of the Standard Oil Company in this movement to the railway discriminations upon oil received from pipe lines controlled by that company. It appears that for a considerable period a rebate of 22 cents per barrel was allowed on oil from the pipe lines maintaining the agreed rates of pipage. These discriminations are more fully described under the head of Railway Discriminations. Other opponents of the combination ascribe its success in driving out competing pipe lines largely to the practice of paying premiums upon oil in the territory of such competing lines.

Mr. Boyle gives the fullest statement of the growth of the pipe line consolidation during the seventies, and attributes it to the natural advantages arising from large capital and from skill in organizing. He testifies that during the early part of the decade very numerous pipe lines had been established. These were at first constructed on a small scale by separate oil producers, but having entered the business many producers were inclined to extend their lines and form a system. There thus arose an excessive number of competing lines, and the solvency and integrity of some of them became a matter of doubt. This excessive competition was the cause of driving the pipe lines into a more complete organization. As early as 1873 or 1874 a pooling arrangement was made by some of the pipe lines, and rebates were paid by railways on oil received from such lines. The United Pipe Line Company was established in 1877, with a capital at first of $3,000,000, and acquired by purchase a large number of lines. The new company included many producers and stockholders of the smaller companies, but it is estimated that the persons controlling the Standard Oil Company had somewhat more than a one-half interest in the United Pipe Lines. The National Transit Company is the present owner of the United Pipe Lines System, and the Standard Oil Company controls the National Transit Company.

Mr. Archbold states that the small lines which existed during the early period were inadequately capitalized and inefficient in many cases; that consolidation was welcomed by all producers, and resulted in a lowering of charges for pipage from 40 to 20 cents per barrel.

Mr. Rockefeller also speaks of the necessity of very large capital to conduct the pipe line business advantageously.

2. Premiums on oil reached by competing pipe lines.—Mr. Lockwood declares that, by means of the high rebates which the pipe lines controlled by the Standard secured from the railways, they were able to offer higher prices for oil to the producers and to sell at lower prices to refiners than independent pipe lines were. In this way twenty-six pipe lines, built during the early seventies, were driven into bankruptcy, and were absorbed by the United Pipe Line and the American Transfer Company. These pipe lines were practically shut out of the market.

A similar policy has been pursued in attacking independent pipe lines built later. Thus, in 1887, Craig, Elkins & Kimble built the Western and Atlantic Pipe Line. The price of oil at that time was 69 cents, but by the time the new pipe line was fairly in operation, in 1888, the price was raised to 88 cents per barrel, while the white-sand oil in the counties reached especially by the new pipe line was placed at a premium by the Standard Oil Company, which paid from $1.08 to $1.13 for oil at the wells. In November, 1889, the price of this oil had reached $1.30, and the witness, as a producer in that district, was drilling many wells in the hope of very large profits. About this time the new pipe line was bought by the Standard Oil Company at the price demanded by its owners, and the very next day the premium on oil from this district was taken off, while the price of crude generally fell gradually to 53 cents. The witness and other producers suffered great losses from this reduction, while the Standard Oil Company made sufficient profits by it to recompense itself for the purchase of the pipe line. The price of refined oil was not reduced. This great decrease in price could not be attributed simply to the increase in production.

Mr. Phillips also testifies to the practice of the pipe lines controlled by the Standard Oil Company of paying premiums on oil for the purpose of attacking competitors. He also believes that the Standard recoups itself for the cost of pipe lines purchased by lowering prices to producers and raising them to consumers.

Mr. Boyle considers the paying of premiums upon oil in fields reached by independent pipe lines a necessary method of competition. The new pipe lines make it a practice to cut charges for pipage in order to secure business, and the Standard Oil Company practically merely meets such cuts by paying premiums upon oil from the district, while keeping its nominal pipage charge the same. The witness referred especially to the Peerless or Keystone pipe line, which fixed a pipage rate 5 cents below that of the National Transit Company, so that the latter was forced to bid a premium of that amount in order to get oil. The same condition of affairs existed regarding the Craig-Elkins line referred to by Mr. Lee. On being questioned further concerning the amount and purpose of such premiums, Mr Boyle stated that he had knowledge of premiums being placed on oil regardless of any superiority in quality, and of premiums being taken off, but that he had no knowledge of the purpose of such premiums.

Mr. Archbold states that the premiums paid by the pipe lines controlled by the Standard Oil Company for oil from particular districts are usually due to superior quality of the oil, this being the case at present with the Franklin, North Lima and Scio oil. But "where we have found, after providing these special facilities, which have no value for any other purpose, that our business was attacked by a newcomer, we have, of course, endeavored to protect it." Mr. Archbold admitted, specifically, that when the American pipe line was built through to Philadelphia, a premium was put on the oil from the large fields in Butler county and

Washington county, and that this premium was taken off as soon as the pipe line had been purchased. "We would do the same thing again." The premium in these cases was due to the competition, unquestionably.

Mr. Rogers confirms Mr. Archbold's testimony in every particular. He states that at present the only premiums which are paid are on account of superior quality. In most cases the Standard Oil Company has been forced to pay premiums by competitors reducing pipage or paying higher prices. A premium is not to be considered as of the nature of a rebate, since it goes to the producer, while pipe line charges are paid by the refiner or exporter, and rebates would go to them.

3. Existing independent pipe lines.—Aside from the competition of the Producers' and Refiners' Pipe Line, hereafter referred to, the Standard Oil Company meets competition in the Ohio field from the Manhattan Oil Company, and in the Indiana field from the Cudahy pipe line. There is trifling competition in the Scio field.

OPPOSITION OF STANDARD TO FREE PIPE LINE LAW.

Opponents of the Standard Oil Company declare that a further means by which the combination prevented the establishment of competing pipe lines and secured its monopoly was the preventing for a long time of the passage of a law in Pennsylvania permitting the exercise of the right of eminent domain throughout the State for the laying of pipe lines.

Mr. Emery testifies that the first pipe line companies were chartered by special acts of the Legislature, and that privileges were given only to a favored few. The indignation over the exposure of the South Improvement Company scheme in 1872 forced the Legislature to pass a law granting any person the right to lay pipe lines, with the privilege of eminent domain, within eight of the leading oil counties. The witness at that time sought to persuade Mr. Scott, president of the Pennsylvania lines, to reach competing lines of railway and water transportation. This Mr. Scott refused to do, and the act did not apply to Allegheny county, so that pipe lines could not reach the city of Pittsburg.

Numerous pipe lines were established under this act, but it was practically repealed by the Wallace Corporation Act in 1874, and within a few years the Standard Oil Company, by a corrupt bargain with the railroads for discriminating rates, forced all but one of these lines into bankruptcy, and bought them up. Since 1876 the entire oil district has been under the complete dictation of the trust, until the organization of the new independent pipe lines, beginning about 1890.

Mr. Emery, who was a member of the Pennsylvania Legislature, and actively engaged in pushing the passage of the free pipe line bill from 1874 to 1883, further declares that the Standard Oil Company did directly oppose that bill. In 1883, when he and Mr. Lee were making speeches in behalf of the bill in various parts of the State, the Standard Oil Company attempted to influence the farmers by arguing that pipe lines would injure their property. The witness refers specifically to a meeting which was held in favor of the bill at Lancaster, Pa., at which dodgers were scattered headed: "Look out for false prophets." The dodgers declared that "these people are endeavoring to pass a law that will destroy the springs of your farms; it will blow up your houses; it will create havoc in your fields when the pipe bursts, killing the grass. Most dangerous of all laws." Mr. Archbold, so Mr. Emery declares, is mistaken in his testimony on this point.

Mr. Lee's testimony states practically the same facts as Mr. Emery's on this point, in less detail. He adds that in 1883 the Standard Oil Company probably controlled 90 per cent of the crude oil transported, and it has sought to secure control of all new lines since that time, so that it still has practically the same proportion.

Mr. Archbold denies that the Standard Oil Company opposed the passage of the free pipe line law in Pennsylvania. The company was entering the business largely and understood the importance of the measure to the entire petroleum trade. He denied the issuing of any circular opposing the measure, but modifies this statement by saying that he does not know of any being issued.

Mr. Boyle knows of no direct opposition of the Standard Oil Company to the passage of the free pipe line law in Pennsylvania, or to the laying of independent pipe lines, although he knows of a single instance where the Standard Oil Company secured a right of way in order to prevent another pipe line from being built.

OPPOSITION TO LAYING OF INDEPENDENT PIPE LINES.

1. Charged against Standard.—Another method which has been employed by the Standard Oil Company to prevent the laying of competing pipe lines appears to be the purchase of land intended to be crossed by such pipe lines and the influencing of railways to oppose the crossing of their tracks by such lines.

Mr. Lee testifies that this practice was employed during the earlier history of the pipe lines. The most active opposition to the laying of such pipe lines, however, was manifested when the independent oil interests in Pennsylvania attempted to establish the United States Pipe Line to the seaboard. Mr. Lee's testimony on this point is substantially the same in general import as that of Mr. Emery given below, but is less detailed.

Mr. Emery gives a detailed history of the attempt to lay the United States Pipe Line, of which he was a prime mover and the first president. He states that in 1890 he determined personally to build a line to the coast, if possible, to avoid the excessive transportation charges. He first went to the president of the Reading Railroad with a view to securing a contract for transporting oil by that railroad from Williamsport, Pa., pending the further extension of the line. After some delay he received the reply: "If we give you this contract, we shall disturb our relations with the Standard Oil Trust, and we can not do it." He then determined to lay the line along the boundary of New York and Pennsylvania to Hancock, N. Y., and to secure a contract with the New York, Ontario and Western for transporting oil to the Hudson, with a right to construct a pipe line later along its tracks. This contract having been secured he approached the Erie Railroad,

and was told by Mr. Thomas, its president, that he would be permitted to cross the road at Bradford and to pass under its bridge over the Delaware at Hancock or through the bank of the road.

Meantime Mr. Emery had been employing experts to secure right of way for the pipe line. As soon as the movement became known a number of men, who the witness knows were connected with the Standard Oil Company, began to seek a right of way over this same territory. They bought mortgages against pieces of land along the route to induce the owners to give them another right of way. They bought a number of strips of land in New York, just beyond the Pennsylvania State line, crossing the pipe line. In New York the former free pipe line law had been so amended as to be practically ineffective. All these difficulties were, however, finally overcome, after great delay and expense.

When the attempt was made, however, to lay the pipe line under the Erie Railroad, at Bradford, the witness was surprised to find it opposed by force. His employees drove away the railroad men, but the laying of the pipe was afterwards prevented by injunction of the Courts, although it had been intended to cross at the same place where the two Standard pipe lines had been permitted freely to cross. At Hancock, also, without warning about such opposition, the men building the new pipe line were met at the bridge of the Erie Railroad with forcible opposition. They remained there three months, but were finally compelled to give up the attempt. At the same time the New York, Ontario and Western violated its contract, and the pipe line was finally forced to go back seventy miles to the Susquehanna river, and to build from Athens to Wilkesbarre. It was necessary to make legal contests for the crossing of every railroad, and the witness comments on the fact that almost identically the same briefs were presented by lawyers of different railroads at different places in their opposition. The various expenses of litigation, loss of time and business, entailed a loss of $150,000 in reaching this point.

For some time the pipe line transported oil from Wilkesbarre by rail over the New Jersey Central. It then sought to extend its line farther toward the coast. It succeeded in crossing the Pennsylvania Railroad by obtaining ownership of an acre of land. When it reached the Delaware, Lackawanna and Western a farm was bought over which the railroad passed, and it was believed that the line could be legally laid under a culvert where the owner of the land has an undisputed right of passage. Nevertheless the line was built by night, and was strongly secured in place and guarded. The employees of the pipe line company forcibly prevented a large number of railroad employees from taking up the pipe line. It was arranged that men on each side should be arrested in order to make a peaceable legal fight, but while these proceedings were going on a couple of locomotives were brought up by the railroad, and hot coals, hot water, stones, etc., were thrown at the men below. The railway employees were finally driven away; the pipe line employees secured arms and held possession of the field for seven months. The lower Courts decided in favor of the pipe line, but after four years of litigation the Supreme Court of New Jersey has decided that the pipe line must be removed. The line does absolutely no harm. The line will ultimately have to build to Philadelphia.

The pipe line company now transports oil from this point fifty miles over the New Jersey Central to the coast. The amount paid for freight is not, as stated by Mr. Archbold, $6 or $7 per car, but about $10 per car, a high rate for that distance. The actual rate is 7.8 cents per barrel on refined and 6½ cents on crude.

Mr. Emery believes that New Jersey and other States should pass laws allowing pipe lines to be laid wherever desired, by taking land by eminent domain, and paying the damages, just as is practiced in laying railways. He has attempted to secure the passage of such an act in New Jersey, but implies that corrupt influences prevented it.

Mr. Phillips testifies that it was the belief of the independent interests that the opposition to the laying of the United States Pipe Line through New Jersey was instigated by the Standard Oil Company. Mr. William Rockefeller is a director, he has been informed, of the Delaware, Lackawanna and Western Railroad.

2. Denial.—Mr. Achbold testifies that the opposition of railways, especially the Delaware and Lackawanna, to the crossing of their tracks by the United States Pipe Line Company was not caused by the influence of the Standard Oil Company in any way whatever. In this particular case the pipe line company had carried its line across the railway surreptitiously, on a Sunday, and had then placed an armed force to protect it. The Supreme Court of New Jersey finally decided that the pipe line company must remove its line.

The freight rates now received by the United States Pipe Line Company from the terminus of its line to the seaboard, over the Central Railroad of New Jersey, are lower than the Standard Oil Company has ever received for an equal distance.

The crude oil is carried 52½ miles at the rate of $7.93 per tank car containing twenty tons, and the railroad returns the empty cars free. This contract is for one hundred years, and may be abrogated by the pipe line company upon five years' notice, the railway company having no right to abrogate it.

Mr. Boyle is inclined to believe that the methods used by the Standard Oil Company in opposing the laying of pipe lines by the independent oil men are entirely justifiable. It is just as fair to purchase land in front of a pipe line to prevent its passage as to purchase land desired by a competitor for any other purpose, by offering a higher price than the competitor can afford to pay. The duplication of pipe lines generally is wasteful and inexpedient.

Mr. Boyle also cites an instance where the Standard Oil Company itself encountered opposition to the laying of its pipe lines by other refiners. In 1874 the National Transit Company undertook to lay a pipe line from Parkersburg to Macksburg, and were stopped at several points by the leasing of land to Mr. Ogle at the instance of Mr. George Rice. Contracts were made with farmers to secure the exclusive right to cross their lands at exorbitant prices. Mr. Rice

actually built a pipe line, but not in accordance with these contracts, his sole purpose being to prevent the laying of the Standard's line.

NATIONAL TRANSIT COMPANY.

1. Charter.—The present charter of the National Transit Company is identical in ite terms with the charter held by the South Improvement Company. Mr. Emery submitted the full text of both charters and described the manner in which the National Transit Company secured its charter, proving his statement by official records. On March 22, 1871, a charter was granted to the Overland Contract Company, the incorporators being the same persons who received the charter of the South Improvement Company on May 6, 1871. Both companies were given the powers contained in the charter of the Pennsylvania Company, passed April 7, 1870. The name of the Overland Contract Company was changed, on May 16, 1871, to the Southern Railway Security Company. This company failed to pay taxes on its capital stock to the State of Pennsylvania, and in 1873, the amount then due the State being $18,345, its charter was seized by the State and was held until 1881. At that time it was sold by the State for $16,251 to individuals who later transferred it to the National Transit Company.

The witness dwelt especially upon the fact that the existing National Transit Company has the same excessively wide powers as were given to the South Improvement Company, and implies that it is abusing these powers in essentially the same manner as that company did.

2. Efficiency of Pipe Lines.—Mr. Boyle submitted an extract from the Pittsburg Commercial Gazette of May 5, 1892, showing the manner in which the National Transit Company had met the immense demand for new facilities for storing and transporting oil during the rapid development of the McDonald field in 1891. In July of that year the output of the McDonald field was only about 3,000 barrels daily. By the middle of August it had reached 15,000 barrels, but by the 1st of September the National Transit Company was able to handle 26,000 barrels per day. By the 1st of October it could handle 40,000 barrels per day; and when in November the porduction of oil reached nearly 80,000 barrels per day the capacity of the pipe lines had been raised above that figure. Iron tankage of the capacity of 3,000,000 barrels was erected during these few months and 53 miles of pipe of different sizes were laid within a territory of 12 square miles. Many powerful pumps were installed to force the oil through the pipes. In round numbers 10,000 tons of iron and other building materials were shipped into the McDonald field for erecting tankage alone.

The witness refers to this experience as showing the necessity of large consolidated capital to meet the exigencies of the oil business. It would not have been possible, even if numerous large pipe lines had existed, growing up under a free pipe line law, for them to cope with such a sudden demand unless by constant and thorough co-operation. The new independent pipe lines have not shown themselves at all competent to meet the needs of the producers.

3. Amount of Business, Etc.—Mr Rogers states that the amount of residuum in the bottom of the tanks of the National Transit Company is published monthly. The company owns about 35,000 miles of pipe, ranging from 2 to 8 inches in diameter. The estimated amount of oil in pipes 5 inches in diameter and over on October 1, 1899, is 535,528 barrels. The witness submitted the following statement of credit balances outstanding against the National Transit Company from 1889 to 1899.

CREDIT BALANCES IN NATIONAL TRANSIT CO.

[IN BARRELS OF CRUDE OIL OF 42 GALLONS EACH.]

Time.	Barrels.
June 30, 1889	3,217,749.16
December 31, 1889	3,160,156.81
June 30, 1890	3,794,873.84
December 31, 1890	2,758,654.30
June 30, 1891	5,406,170.38
December 31, 1891	3,201,351.34
June 30, 1892	5,987,319.53
December 31, 1892	5,532,079.21
June 30, 1893	4,340,713.15
December 31, 1893	2,705,563.20
June 30, 1894	2,453,417.82
December 31, 1894	1,644,255.13
June 30, 1895	783,592.96
December 31, 1895	1,809,325.78
June 30, 1896	3,275,075.49
December 31, 1896	4,215,060.28
June 30, 1897	5,413,417.10
December 31, 1897	4,523,054.39
June 30, 1898	4,450,703.02
December 31, 1898	3,822,997.28
June 30, 1899	4,910,451.22
September 30, 1899	5,349,392.54

According to Mr. Davis, the pipe line companies (in the Ohio field) have their own experts for gauging tanks, although the producer may have a representative present when the tanks are gauged. The pipe line company deducts 2½ per cent of the amount of oil received form the producer on account of the waste and evaporation. There is considerable sediment and surplus in the tanks belonging to the Standard Oil Company, but it is supposed that this is partly sold to refiners and partly charged up against producers. When losses by fire occur the producers in the locality are assessed by a reduction of their credit balances, although the witness believes there is no contract authorizing this.

EFFECT OF PIPE LINE MONOPOLY.

1. Control of Competition.—It was pointed out by several witnesses that the almost complete control of the pipe line system by the Standard Oil Company gives it great power in fixing the prices of crude oil, since producers can dispose of their product only through the pipe lines, especially in

view of the fact, which is alleged, that railway rates on crude oil are by agreement kept at least as high as, if not higher than, the pipe line charges. The pipe line system also gives the combination great advantage over other refiners, who must pay the rates of pipage fixed by the Standard, which are claimed to be excessively high, or the high rates of freight. The evidence in detail as to the arrangements between the railways and the pipe lines is given under the heading "Railway Discrimination." The evidence as to pipe line charges follows.

2. Purchase of Crude Oil by Pipe Lines.—The practice of the pipe line companies controlled by the Standard Oil Company is to receive all oil produced by the wells with which their pipes are connected, gauging the amount and recording the quantity received form each producer. The producer can then at any time, by the custom of the business, although not by contract, receive from the company the value of his oil in store at the price for that day. He can instead receive "pipe line certificates" for 1,000 barrels each, which are negotiable in open market. The independent pipe lines apparently follow the same practice and often pay from 1 to 9 cents per barrel more than the Standard Oil Company.

3. Pipe Line Charges.—Mr. Lee, Mr. Phillips, Mr. Emery, Mr. Davis and Mr. Rice maintained that the pipe line charges of the standard Oil Company are excessive. The rate for local pipage is 20 cents per barrel, and for the transportation of oil to the seaboard 45 cents per barrel. These rates have not been reduced for fully 20 years. The rate charged by the independent pipe line organizations for local pipage is 15 cents per barrel.

Mr. Phillips testifies that he has been informed that the cost of transporting oil through the United States Pipe Line, when carrying half of its capacity, is about 5 cents per barrel as far as the terminal in New Jersey. The cost of gathering oil in the porducing field is estimated at from 3 to 5 cents per barrel.

Mr. Lee points out that the cost of 2-inch pipe has fallen from 35 cents to 6 cents per foot. He believes the cost of local pipage is from 7 to 8 cents a barrel.

Mr. Rice believes that the cost of local pipage does not exceed 5 cents and that the cost of pipage to the seaboard is about the same. In proof of this Mr. Rice refers to a paragraph in a contract between the National Transit Company and the Tidewater Pipe Company, referring simply to their local lines. In this contract a division of traffic is arranged for, and it is provided that if either party shall gather by its local lines more than its percentage it shall pay to the other three-fourths of the local charge, i. e., 15 cents on each barrel of such surplus. In accordance with the customary method of pooling, there is a certain implication, although not conclusive, that the actual cost of piping is 5 cents, the profits from the surplus charge above actual cost being paid over to equalize the traffic.

Mr. Rogers, president of the National Transit Company, believes that the pipe line charges of the company, 20 cents per barrel, are reasonable, although they have not been lowered for twenty years. The company undertakes to lay pipe lines without extra charge to new wells, even though 15 or 20 miles distant, if there is a reasonable prospect of considerable petroleum. Such laying of pipes involves considerable risk, since the production may prove slight or may decline. Although the company takes up the pipe lines which are no longer needed and uses the material elsewhere, this involves considerable expense. The witness does not believe that the independent pipe lines, which make a lower pipage charge, are prepared to furnish facilities wherever demanded; their systems are confined to narrow fields.

The practice of charging the same price to all producers is, on the whole, fair, in view of the constant change of conditions regarding each well.

The witness does not know the actual cost of gathering oil or the profits of the National Transit Company. The charge for carrying oil to the seaboard is 45 cents per barrel, and the witness does not think that anybody knows what the actual cost is.

The cost of pipage in any case does not affect the producers, but comes from the purchaser of the oil. The receipts given by the pipe lines apply to oil received at the wells, and are immediately merchantable.

On being questioned as to the reason why no further reduction in pipage charge had been made, Mr. Archbold testified that the cost of laying pipes had been sometimes more and sometimes less than before, and that the long distance for which pipes have frequently been laid to reach new fields have involved heavy outlay.

REBATES AND DISCRIMINATIONS BY PIPE LINES.

Mr. Boyle submitted a series of letters between R. P. Crawford and Mr. H. McSweeney, and also a letter from Mr. S. C. T. Dodd, solicitor of the Standard Oil Company, all these letters bearing dates during 1884, referring to the matter of rebates granted by the pipe lines during the seventies. In his letter Mr. Dodd states that about 1879 Mr. Crawford and others brought suit against the United Pipe Lines, a Standard organization, asking for forfeiture of its charter on the ground that it had made discriminations in pipage charges between different individuals. Criminal suits on the same ground were brought at the same time. Mr. Dodd found that, so far as any discrimination had existed, it was due to contracts for special rates which had been inherited from pipe lines absorbed into the United Pipe Line Company, among which was one between Mr. Crawford, for the Bear Creek Oil Company, and the Mutual Pipe Line Company. Such discriminations were believed by Mr. Dodd to be against public policy and he ordered them discontinued. The letters form Mr. Crawford to Mr. McSweeney demand the payment of 5 cents per barrel upon all oil received from certain wells between

1879 and 1884 on the ground of this previous contract with the Mutual Pipe Line Company for a 15-cent rate of pipage. The demand was finally refused by Mr. McSweeney in view of the information furnished by Mr. Dodd in his letter.

IMMEDIATE SHIPMENT.

Mr. Boyle states that there has been considerable confusion in the public mind in regard to the meaning of the phrase "immediate shipment" in connection with oil. This practice was first resorted to in 1872, but was most prominent during the excessive production in the Bradford field. At this time it was impossible for the pipe line companies to furnish tankage with sufficient rapidity, and it became the custom to take oil for immediate shipment, so that the purchasers might come into the market owning tankage and having cars to ship oil and purchase oil at a lower price than prevailed on the regular markets.

INDEPENDENT PIPE LINES AND OTHER ORGANIZATIONS.

HISTORY OF ORGANIZATIONS.

Much testimony was given concerning the various organizations recently formed by the independent oil producers and refiners, their relations to one another and to the Standard Oil Company.

According to Mr. Boyle, these movements grew out of the earlier Producers' Protective Association, which during 1887 and 1888 had formed an agreement among producers and between them and the Standard Oil Company for restricting production. He states that this organization first attempted to build an independent refinery, but impracticable men were put in charge and it failed.

The first pipe line company to be organized was the Producers' Oil Company, Limited, which built a pipe line from the refineries in Titusville and Oil City to the new McDonald oil field. The next company to be formed was the Producers and Refiners Oil Company, which brought in the independent refiners to assist in the movement. According to Mr, Boyle this new company, capitalized at $250,000, practically took over the property of the Producers' Oil Company, capitalized at $600,000. It appears from other witnesses also that these two companies are substantially identical, although maintaining separate organizations.

The United States Pipe Line Company was the next to be organized, the purpose being the transportation of both refined and crude oil to the seaboard. The last company formed was the Pure Oil Company, organized in June, 1895. Mr. Boyle declares that previous to the formation of this company an attempt had been made to combine the other independent organizations, which was checked by suit of some of their stockholders. One of the chief purposes of the new company was to secure control of the other two companies. It was organized as a New Jersey corporation in 1897, with an authorized capital of $1,000,000, of which about $377,000 has been paid in.

The testimony of Mr. Boyle concerning the organization of the Pure Oil Company and its purpose of securing control of the stock of the other independent companies is confirmed in most particulars by Mr. Lee, and especially by Mr. Phillips, who said that the four independent organizations are practically controlled by the same individuals. The persons who took stock in the first company were also stockholders in the others. The purpose of the organization of the Pure Oil Company is largely to prevent the Standard Oil Company from securing control of any of the other independent organizations, as it has repeatedly attempted to do. It is expected that ultimately a majority of the stock of each of the other companies will be held by the Pure Oil Company. It has been proposed to increase the capital of the company to $10,000,000. The Pure Oil Company is also engaged in marketing refined oil, and has been specially successful in Germany.

CHARACTER OF INDEPENDENT ORGANIZATIONS—VOTING TRUST.

There was considerable controversy between the witnesses defending the Standard Oil Company and those opposing it as to the precise character of the Pure Oil Company. Mr. Boyle and Mr. Archbold declared that it was a trust of the closest possible kind, basing this statement both upon the fact that it was seeking to combine other corporations, and especially upon the fact that its stock has been put in control of a voting trust.

1. Text of Agreement of Pure Oil Company.—Mr. Boyle and Mr. Archbold each cited in full the former voting-trust agrement of the Pure Oil Company. Mr. Lee later furnished the commission with a copy of the present voting trust agreement, which contains some important changes from the earlier one.

This agreement states that the purpose of its formation is to prevent at all times a diversion of the resources and business of the Pure Oil Company from their intended use and coures, in opposition to monoply in the business, and to permanently protect and maintain what are known as the independent interests in the petroleum industry. The holders of 16,000 shares, being more than a majority, vest the voting power of such shares in 15 persons for 20 years, and it is agreed that one-half of all shares hereafter subscribed shall similarly be transferred, but this shall not give to purchasers any right other than provided in the trust agreement. The trustees are to vote for the election of all directors to the full number of shares so held, as a unit. In case of difference of opinion among the trustees a four-fifths vote of the shares held in trust shall decide the matter. One-third of the trustees retire annually and their successors are elected by the

general stock holders. Any trustee may be summarily removed by three-fifths of the trustees together with three-fifths of the shareholders in trust. By similar vote, but in no other way, the trust agreement may be modified.

2. Rules of Pure Oil Company.—Mr. Boyle also submitted the by-laws and regulations of the Pure Oil Company. The following quotations will give a clearer idea of the precise nature of this organization. They show clearly the purpose of the Pure Oil Company to acquire control of other corporations, and to prevent the stocks of such corporations from falling under the control of outside interests.

"1. The business of the company shall be the producing, purchasing, transporting, storing, and selling of crude petroleum and its products, and aiding other companies and parties in the production, transportation, storage, manufacturing, and sale of the same. The corporation may acquire, hold, manage, and dispose of any stocks, shares, bonds, and other interests in or issued by any corporation, joint stock company or limited partnership association engaged in, or aiding, or promoting the producing, transporting, storing, refining and selling of crude petroleum or its products, or in any business incident thereto."

"5. Interests of the company will be represented by shares which may be divided and transferred, including preferred, common and deferred shares, to be issued, held and transferred, subject to the by-laws and regulations of the company."

"6. A majority of all the shares of the company shall be held in a permanent trust approved by all the shareholders, to secure the control of the company and the faithful maintenance of the policy agreed on for conducting the business of the company in the interest and for the protection of all concerned in its affairs. The shares so held shall be designated as trust shares."

"8. No preferred stock shall be issued except as cash to the extent of one hundred dollars for each share of such stock issued shall be paid into the treasury of the company to the credit of capital, or of surplus, or of the guaranty and redemption fund, to be created as prescribed in section 2 hereof, as may be deemed advisable."

"9. The deferred shares of the company may be issued for cash, investment securities, property, services, payment of expenses, making disbursements of any kind, and in exchange for shares of other classes issued by the company at the discretion of the directors, with the written consent of the owners of a majority of the shares of the company at the time outstanding.

"10. The holders of preferred stock shall be entitled to receive cumulative dividends thereon of one dollar and a half per share quarterly, in full, before any dividend shall be payable on the common stock."

"12. The guaranty and redemption fund shall be applicable to the general uses of the company, but may be applied to buying shares of all classes, in the order of their priority or right to dividend, as stipulated, at the lowest rates at which any shares of the same class can be bought, not over one hundred and ten dollars per share, on demand of the several owners and holders of shares, respectively, made within a prescribed time after the payment of dividends."

"13. * * * The shares of any class so purchased may, when authorized by the owners of a majority of all the shares of the company, be resold at any time, at the discretion of the directors, at any price not less than that at which they were severally purchased; or they may be retired from the classes to which they belong, and be placed in the treasury of the company, to be held, reissued and sold for its use and benefit, subject to such conditions as the directors may prescribe, in accordance with the regulations of the company."

"15. The owners of a majority of the trust shares, acting together, shall have the right to convey to the company, absolutely or in trust, permanently or temporarily, and subject to such conditions as may be stipulated in such transfer, any securities regularly yielding net income, provided that the receiving and holding of such securities shall not subject the company to any prejudice, or embarrassment, or legal liability to pay any money on account thereof; and no such temporary transfer in trust shall be terminable until the well-established net income of the company from its regular business and other sources of permanent revenue shall be equal to the maximum amount to which it may be raised by such temporary transfer in trust."

3. "Trust" Character of Pure Oil Company—On the basis of this voting trust agreement Mr. Boyle and Mr. Archbold declare that the organization of the Standard Oil Company was fully as justifiable in its nature as that of the Pure Oil Company, and that the latter is as much a trust as the former ever was. Mr. Boyle especially emphasizes the clause seeking to make the voting trust, as he states, perpetual, by providing that it may be dissolved only by the winding up of the Pure Oil Company, or by the consent of the equitable owners of four-fifths of the shares held in trust, together with four-fifths of all other shares of the company, after providing for the redemption of all preferred and common shares of the company then outstanding at $110 per share. It is to be noticed, however, that this clause is modified by the new voting trust agreement, which provides that the trust may be cancelled by a vote of three-fifths of both classes of shareholders, on the redemption of the preferred shares only, at $110 per share. Moreover, the charter of the company itself expires in 46 years.

4. Denial of "Trust" Character — Mr. Phillips and Mr. Emery are exceedingly emphatic in denying that the Pure Oil Company is a trust in any such sense as the Standard Oil Company is. The sole duty of the trustees, as holders of a majority of the shares, is to vote along with other stockholders in electing directors. The directors manage the affairs of the company. The large number of the

trustees, fifteen, is due to a desire to make the body representative of the interests of the oil country.

The formation of the voting trust was rendered absolutely necessary by the attempt of the Standard Oil Company, through the National Transit Company, to secure control of the Producers Oil Company and the United States Pipe Line Company, through the purchase of shares—a transaction which Mr. Phillips describes fully.

The Pure Oil Company was not organized for the purpose of securing a monopoly, as the Standard Oil Company was, but to prevent a monopoly and to preserve competition in the petroleum industry. It is not the purpose of the Pure Oil Company to get control of any other person's business or to absorb its competitors, but merely to put the business of its own constituents in such a form as to prevent its destruction. The company and its members desire only a fair portion of the oil business, not the whole of it. If it were possible for this company to obtain a monopoly of the entire market, Mr. Phillips would not desire to be connected with it; the responsibility would be too great. Although the Standard Oil Company does not control the entire industry, yet its control of over 80 per cent. of it is sufficient to constitute a monopoly and to enable it to fix prices. The Pure Oil Company, on the other hand, has none of the characteristics of a trust in the sense of an industrial combination or monopoly, as defined in statutes, dictionaries and common thought.

Mr. Emery added also that the independents feared that when the voting trust of the United States Pipe Line expires, as it will in a short time, the Standard Oil Company will secure control of still more of its stock and attempt to control it. This is one of the motives for the organization of the Pure Oil Company, and the attempt to secure control through it of the stock of the other independnt corporations. It has not yet, however, been decided finally that the Pure Oil Company shall consolidate the others, but it is being seriously discussed.

5. Voting Trust of United States Pipe Line Company—Mr. Archbold also cited in full the voting-trust agreement of the United States Pipe Line Company. This agreement states that the voting trust is created in view of the fact that the company is organized by persons each interested peculiarly in the oil business, and for the purpose of securing and furnishing to each an independent outlet for his products, both crude and refined, not controlled or influenced by others hostile to their respective interests. In order to keep the control of the stocks of the company in hands friendly to the independent interests, the signers of the agreement vest their respective interests in the stocks of the company in A. D. Wood as trustee for the period of five years from April 1, 1893, unless sooner terminated by a vote of three-fourths of the stocks so held in trust. No sales of stocks so held in trust shall be made by the equitable owner thereof during the continuance of the trust. The trustee has the full power to elect officers, but is bound to vote for persons interested in the business of refining, producing and exporting oil, and to fulfill the general purpose of the contract.

Mr. Emery replies to this that the voting-trust agreement of this company also was rendered necessary by the attempts of the Standard Oil Company to control it.

ATTEMPTS OF STANDARD TO CONTROL INDEPENDENT PIPE LINES.

Mr. Lee, Mr. Phillips, Mr. Emery and others testify that the Standard Oil Company has made attempts to secure control of all of the independent pipe lines and organizations and of the Pure Oil Company by purchasing their stock. Through the National Transit Company it secured a large proportion of the shares of the Producers Oil Company, Limited, and placed them in the name of John J. Carter. He brought suit to secure a right to a voice in the organization, but since it was a limited partnership, the courts upheld the rights of the company to deny him admission. The Standard Oil Company purchased, through the National Transit Company, $383,000 of the capital stock of the United States Pipe Line Company, and has successfully brought suit to secure the right to vote this stock.

Mr. Davis, who speaks from information rather than from personal knowledge, gives essentially the same facts.

He adds that the Standard Oil Company has bought up a considerable number of oil wells along the independent pipe line of the Producers and Refiners Oil Company, forcing it to lay longer pipe lines to other wells. The Standard paid high prices for these wells.

Mr. Archbold admits these purchases of stock in the Producers Oil Company and in the United States Pipe Line. They were made as an investment, "and with a view to having such knowledge as we could have rightfully through such ownership—as we should acquire in the progress of the affair." The proportion held by the Standard Oil Company was actually less than one-half in each case. The company was so opposed in the exercise of its ownership in the Producers Oil Company that it sold out to Mr. Carter. This sale was in good faith and the Standard has no control over the stock after the transfer. At one time Mr. Carter did own more than a majority of the stock, but under the Pennsylvania law, which the witness considers "a very queer one," the courts held that he could have no voice in the company, which was a limited partnership, without its consent.

The courts have upheld the ownership of the Standard Oil Company in the United States Pipe Line, and it is recognized on the board of directors. It has never done anything to injure the business of that company, and "if that iniquitous voting trust is ever dissolved the shareholders will awake to a feeling that somebody else than those who have managed it could do something for it."

Mr. Rogers confirms the testimony of Mr. Archbold generally on this subject, although he is uncertain as to the proportion of the stock of the Producers Oil Company held by the Standard and Mr. Carter. He does not know whether Mr. Carter was furnished with money to buy this stock by a trust company in New York to which he was introduced by the Standard Oil Company, although it is possible.

Mr. Phillips's description of the purchase of stock in the independent pipe lines by the National Transit Company differs from that of Mr. Archbold in certain details. As high as 220 was paid for stock in the Producers Oil Company, although it was then earning no profits. In March, 1894, before the time when the Standard claims to have sold its stock to Mr. Carter, it turned over the stock to him temporarily, and he attempted to vote it at an important meeting. On January 16, 1896, he claimed that he bought this stock from the National Transit Company. On the trial of the suit by which he attempted to secure admission to the company it was proved that he had borrowed the $300,000 for the purpose from a trust company in New York; and when questioned Mr. Archbold and other agents of the Standard Oil Company declined to answer regarding the ownership of that money.

Mr. Phillips testifies that the amount of the stock of the United States Pipe Line Company secured by the National Transit Company was $383,009 out of a total of $1,190,000. When suit was brought to secure the right of attending the meetings of the company and of voting the stock, which had been refused by unanimous vote of the other stockholders, the lower court decided in favor of the National Transit Company. The suit was never tried on its merits in the Supreme Court of Pennsylvania, but the appeal was quashed on a technicality. The Standard Oil Company takes advantage of its one director upon the board of the United States Pipe Line Company to secure information and to injure that company. This testimony is confirmed by Mr. Emery.

Regarding a letter submitted to the commission declaring that, through the ownership of stock in the independent companies, the Standard Oil Company had brought them into virtual harmony with itself, Mr. Phillips denied the charge entirely.

PROPOSITIONS FOR COMBINATION WITH STANDARD.

1. Facts as to Such Propositions—In connection with the attempts of the Standard Oil Company to get control of the present independent interests, Mr. Archbold testifies that approaches with a view to combination with the Standard have been made from the side of the independents. Nearly every prominent independent, including Mr. Lee, Mr. Phillips, Mr. King, and others, has made some proposition or advance looking toward a combination of interests, but the Standard Oil Company has declined, believing such combination to be illegal, and lacking faith in the men proposing it. Mr. Archbold denies specifically that the Standard ever sent an agent to propose a combination. On being questioned as to whether such advances on the part of the independents were not forced upon them by the fact that the Standard had secured control of a large part of the stock of their pipe line companies, as well as by the crippling of their business in Germany, Mr. Archbold states that he believes that these matters had nothing to do with the proposition. He says that the proposition was simply for a division of business, so that each interest should have a share of the market; not for sale to the Standard Oil Company.

Mr. Phillips replies to these statements of Mr. Archbold that it is true that three or four years ago he himself and certain others did call upon the officers of the Standard Oil Company. This was after the Standard had bought up a number of the independent refineries connected with the independent pipe lines, and also large amounts of the stock of the independent pipe lines. The Standard also was making every possible effort to prevent the independents from marketing oil in Germany, and had bought out Mr. Poth, who had been acting for the independents there. The independents sought simply to obtain cessation of hostilities. In lieu thereof the Standard Oil Company proposed to buy the pipe line system, and when this was refused one of its officers proposed to buy the producing territory of these independents, which was also refused. There have been no recent overtures by the independents to the Standard Oil Company.

Mr. Phillips states further that the Standard Oil Company has frequently sought to secure the moral support of independent refiners and producers, or to withdraw them from opposition, by buying their property and otherwise. The Standard Oil Company once bought from Mr. Phillips a large amount of oil lands and attempted to influence him at the same time to consent to cease all opposition to that company. Certain of the refiners who have been bought out have been given positions in connection with the Standard Oil Company.

Mr. Emery also testifies that there has been no proposition on the part of the independent pipe lines to combine with the Standard Oil Company. At the time when he was president of the United States Pipe Line Company a resolution was passed for the appointment of a committee to confer with the Standard Oil Company to ascertain if some arrangement could not be made by which it would permit that pipe line to be laid under the railroads. The resolution did not give any authority to discuss the sale of any portion of the property, and the witness is sure that the committee made no such propositions.

2. Reasons for Refusing to Combine With Standard—Mr. Lee testifies that a Pennsylvania law formerly prohibited the consolidation of competing pipe lines, but the Standard Oil Company secured its repeal in 1895. The independent local and seaboard pipe lines could sell out at a high valuation to the Standard Oil Company, but they are largely owned by the producers of crude petroleum, who believe that the price of their product is increased

by the competition of these pipe lines and of the independent refiners who secure their oil from them. The owners of from 40 to 50 per cent., probably, of the crude production are shareholders in these pipe lines.

Mr. Phillips declares that the producers of crude oil who are interested in the independent pipe lines feel that they cannot afford to allow the stock to pass into the hands of the Standard Oil Company at any price. He is unable to state the value of their stocks, but since the Pure Oil Company has succeeded in getting a fair market in Germany, he considers them very valuable, especially for the reasons already cited.

Mr. Phillips further states that the producers of crude oil are undoubtedly receiving much higher prices, probably 25 cents per barrel, on account of the competition of the independent lines with the Standard in purchasing oil. During the time when the Standard was cutting prices most severely against the independent refiners the independent pipe lines reduced their charges, the producers making the sacrifice for the benefit of the refiners. The independent line has, however, never paid producers less than the Standard was paying, and has frequently taken the initiative in advancing prices from one to five cents per barrel.

There is no doubt, also, that the independent refiners are much better off because of these pipe lines; in fact, without them none would be in existence today. The producers and refiners have united for mutual protection.

EFFECTS OF INDEPENDENT MOVEMENTS ON PRODUCERS AND REFINERS.

The reasons just stated by the defenders of the independent pipe line organizations for their refusal to sell to the Standard Oil Company point out the beneficial effect of these pipe lines upon producers and refiners.

This beneficial effect is denied by Mr. Boyle. He believes on the whole that these independent lines have been wasteful. They have not paid dividends, save a single dividend of 5 per cent. by the United States Pipe Line at a time when it had no fixed charges for indebtedness; so that the capital invested in them has been to that extent a burden on the oil industry. The Producers Pipe Line has not sufficient capital back of it to enable it to handle large quantities of oil with the rapidity and certainty with which the Standard Oil Company can do so. Thus the first pipe line built by the independent organization into the McDonald field in 1891 reached only a few wells on the outskirts of that field, while the National Transit Company, controlled by the Standard Oil Company, was forced to build new tanks and lay pipes with enormous rapidity to keep pace with the exceedingly rapid development of that field. On the whole, apparently, the producers, so far as they are actually reached by the independent pipe lines, have, in Mr. Boyle's judgment, profited somewhat by the higher prices for oil. The independent pipe lines pay from one to nine cents per barrel more than the Standard Oil agency, so that the real charge for pipage, which is nominally fifteen cents per barrel, may fall to six cents as compared with the twenty cents charged by the Standard Oil Company. But what is thus gained by the producers is lost by them in the failure to receive dividends from their investments in the pipe lines.

The independent pipe lines have not had the effect of reducing the price of refined oil, nor have they in any way benefited consumers. They have enabled independent refiners to make money much faster than ever before.

Mr. Boyle does not consider that the transportation of refined oil by means of a pipe line is an achievement of any particular significance.

METHODS OF ATTACKING COMPETING REFINERS AND DEALERS.

SPECIAL CUTS IN PARTICULAR PLACES.

1. Evidence of Opponents of Combination—Several witnesses make the broad statement that it is the practice of the Standard Oil Company to attack its competitors by making special reducions in prices in the places where they seek to do business, while maintaining prices at higher rates at non-competitive points, and also by special cuts to individual customers. These witnesses testify that the Standard Oil Company often secures full information as to shipments by its competitors and as to the persons who are their customers, and use this information to drive them out of business. Where a dealer purchases oil from independent refineries, the Standard Oil Company sometimes establishes competing dealers or threatens to do so.

Many specific statements on this subject were made by the different witnesses, a summary of which follows:

Mr. Monnett, attorney general of Ohio, submitted the following list of prices at competing and non-competing points in the State of Michigan:

Name of Town and State	Condttion of Trade	Price of Kerosene	Price of Gasoline
		Cents	Cents
Detroit, Mich.	Competition	5.5	7
Adrian, Mich.	No competition...	8	.....
Ann Arbor, Mich.	" " ...	7.75	.....
Clifford, Mich.	" " ...	8	.....
Howell, Mich.	" " ...	8	.....
Grand Rapids, Mich.	Competition	5.5	6.25
Monroe, Mich.	No competition...	7.5	8.75
Kalamazoo, Mich.	Competition	5.5	.....
Bay City, Mich.	No competition...	7.75	.....
Lansing, Mich.	Competition	6	7.25
Coldwater, Mich.	No competition...	8.25	.....
Jackson, Mich.	Competition	6.5	7.75
Saginaw, Mich.	"	6	.....

Name of Town and State	Condition of Trade	Price of Kerosene	Price of Gasoline
Mount Clemens, Mich.	No competition...	8	8.5
Marlette, Mich.	" " ...	8	.....
Muskegon, Mich.	" " ...	8	.....
Battle Creek, Mich.	Competition	6.25	.....
Benton Harbor, Mich.	No competition...	7.25	.....
Cleveland, Ohio.	Competition	4.75	6
Sidney, Ohio.	No competition...	8.75	10
Dayton, Ohio.	Competition	6.5	6.5
Xenia, Ohio.	No competition...	8	.....
Hamilton, Ohio.	" " ...	7.5	.....
Oberlin, Ohio.	" " ...	7.5	.....
Troy, Ohio.	" " ...	7	.....
Youngstown, Ohio.	Competition	6	.....
Canton, Ohio.	"	6	.....
Warren, Ohio.	"	5.75	.....
Galion, Ohio.	No competition...	8	.....
Newark, Ohio.	" " ...	8	.....

Among the leading competitive points are New York, Philadelphia, Pittsburg, Chicago, Milwaukee, Rock Island, Evansville, Memphis, St. Louis, Des Moines and Kansas City. Competition is seldom possible, except where there is water transportation competing with the railways. The independents have little opportunity on the Pacific coast on account of the rules of the railways.

Mr. Emery is emphatic in his testimony on this point. He himself attempted to distribute oil in Philadelphia between 1891 and 1896, but lost more than $50,000 on account of the cutting of prices by the Standard Oil Company. He was forced to sell oil at three cents per gallon when it was being sold in New York at eight cents. Within four weeks before the time he testified he had sent oil to a certain point and the Standard Oil Company had reduced the price one cent per gallon at that point immediately.

The Standard Oil Company employs persons to watch the business of its competitors, and often sends in advance, when it learns that a shipment of oil has been made to a particular market, and cuts the price before the oil arrives there. The witness makes this statement from his personal experience. It is confirmed broadly by Mr. Lee.

In certain cases the first cuts in prices are made by the competitors of the Standard Oil Company. This is sometimes necessary where a customer declares that he is in the habit of buying from the Standard or prefers to do so. Ordinarily the aim of the witness and of other independent refiners is to maintain prices, merely securing a fair proportion of the business, and the beginning of cutting usually comes from the other side.

2. Competition at New York City—Mr. Lee testifies that in New York, Brooklyn and Jersey City, in March, 1896, the price to local dealers was 9 to 9½ cents per gallon, while the witness maintains that seven cents would have paid a handsome profit. When the Pure Oil Company began marketing oil in opposition, the Standard Company cut the price to 5½ cents per gallon, where it has remained practically unchanged. The decline in the price of crude oil at the same time was scarcely more than 10 per cent. A similar experience was met with in Philadelphia, where prices are now even lower than in New York. The purpose of these excessive cuts was to destroy the competitors. The number of competitive points, however, is increasing as the independent interest is growing in strength. These points are usually at a great disadvantage in rates of transportation.

Mr. Westgate corroborates the testimony of Mr. Lee as to the cutting of prices below cost in New York City and Philadelphia after the Pure Oil Company began business there. Prices were reduced from March 20 to April 4, 1896, from 9½ to 7 cents. Oil is still sold at a loss there.

Referring to the above testimony of Mr. Lee, Mr. Archbold testifies that the average price of refined oil to retail dealers during March, 1896, was 7.98 cents, instead of from 9 to 9½ cents per gallon. In the same month the average price of crude oil per barrel at the wells was $1.42. In April the Standard Oil Company's price for refined oil in New York was 7.31 cents, the price of crude being $1.22. In May, refined 6.94 cents, crude $1.14; in June, refined 6.72 cents, crude $1.15; in July, refined 6.23 cents, crude $1.09. No oil was sold at 5½ cents per gallon, as stated. It would be entirely impossible to make considerable variations in price between different customers. Such variations would very soon be made known, and the practice would be dishonest. (The figures above shown appear to indicate that the reduction in the price of refined oil during the period referred to was about twice as great as the reduction in crude. A fall from $1.42 to $1.09 per barrel amounts to approximately three-fourths cent per gallon, while the fall in the average price of refined oil was 1.65 cents.)

3. New York State, etc.—Mr. Westgate has found that the Standard Oil Company will not cut prices where he does only a limited proportion of the business in any particular place. Thus at Syracuse the prevailing price of water-white oil has recently been 7½ cents a gallon, and the witness handles only about one-tenth of the business. But at Auburn, 25 miles south, the price has been about two cents less ,because the witness has attempted to handle one-third or one-half of the trade. He has found it his best policy to compete on a small scale. He knows of one instance, however, where an independent refiner sent a barrel of oil as a gift to a friend in Maryland, not for selling, but for his own use. The Standard Oil Company discovered the shipment, and sent at once a carload of what was considered the best oil the people there had ever received, at the same time making a heavy cut in price.

The witness cited the following as specific instances of special cuts made by the Standard Oil Company to customers of independent refiners. A letter to him from Shortsville, N. Y., March 23, 1899, from a firm dealing in oil, states that an agent of the Standard Oil Company had said to one of their customers that the Standard was going to force them to buy oil from it, and had cut the price

of oil to seven cents (it had formerly been 10). The witness was accordingly compelled to furnish oil to this firm at such a figure that it should not lose money, which took away all his profit. The witness also submitted a letter sent by the agent of the Standard Oil Company at Portland, Ore., to a dealer in South Bend, Wash., who had informed the agent that oil manufactured by the witness was being sold there. The letter states: "You can rest assured that if another carload of Sunlight oil arrives at your place it will be sold very cheap. We do not propose to allow another carload to come into the territory unless it comes and is put on the market at one-half its actual cost. You can convey this idea to the young man who imported the carload of Sunlight oil." The letter is signed "Standard Oil Company, by George C. Flanders." In Hoboken, N. J., a threat was made against a German dealer that his business would be ruined unless he bought Standard oil, which was offered to him at cut prices. He declared that he would blow up the Standard warehouse with dynamite if his business was ruined, and the Standard agent made an arrangement to furnish him oil, while still allowing him to handle independent oil. At Fulton, N. Y., the Standard established retail peddlers to drive out a man who was peddling Mr. Westgate's oil. To compete the more effectively, they furnished their men with Mr. Westgate's own oil, bought through other parties, and they cut the price from one cent to four cents a gallon.

Mr. Archbold replies to these charges by stating that the peddler at Fulton, N. Y., referred to by Mr. Westgate, had been enticed away from the Standard Oil Company, and was cutting prices against that company, so that it was forced to put on a competing peddler.

The man at Hoboken referred to by Mr. Westgate was a man of violent temper and an anarchist. He has not been in the oil business for a number of years. The agent of the Standard Oil Company at Jersey City denies having threatened him with a cut of prices, and also having come to any agreement or understanding with him.

As to the letter written by Mr. Flanders to a dealer of South Bend, Wash., it was a foolish action, for which Mr. Flanders had no authority whatever. The letter was in fact intended to be jocular and to deny a claim that he was selling oil of an inferior quality, a charge which is often brought against the Standard Oil Company unjustly.

4. Southern States—Mr. Rice testifies that he has been engaged in refining petroleum since 1876 at Marietta, O. He has repeatedly been driven out of various local markets which he has sought, especially in the South, by special cuts made by the Standard Oil Company in particular towns and to particular customers. He declares that the Standard Oil Company has temporarily cut prices below cost to his particular customers, leaving the prices unchanged to nine-tenths of the dealers in town. "They can clean me out on any one car I may send to any one town."

The Standard Oil Company has also made threats against dealers handling Mr. Rice's oil. At one time the Chess Carley Company wrote to Mr. Rice's agents at Nashville, Wilkinson & Co., threatening to establish a grocery store and cut prices on all goods as well as on oil. The company did afterwards set up a grocery store at Columbus, Miss., in order to force merchants to buy its oil. In 1885 the Chess Carley Company made a contract with R. M. Ong, of New Orleans, a copy of which was submitted by the witness in evidence, with a declaration that it was undoubtedly genuine. By this contract Mr. Ong was to be paid a sum of $48,000 in monthly payments during five years. In exchange therefor he sold to the Chess Carley Company the entire profits of the business on illuminating oils and other petroleum products. He was himself to conduct the business and to make no charge except for drayage actually paid out. Mr. Ong agreed to sell no petroleum not supplied by the Chess Carley Company, and to conduct this branch of the business in the best manner possible to promote the interest of that company, and under its general directions.

Regarding the above testimony of Mr. Rice, Mr. Page states that the Chess Carley Company did actually establish one such grocery store at Columbus, Miss., but no other. This was before the Standard Oil Company possessed complete control of the Chess Carley Company, and the witness believes that the Standard itself has never made any such threats or actually established competing stores.

5. Competition in Ohio—Mr. Clark testified that he had been employed as a warehouseman by the Standard Oil Company in Marietta, O., and later at Springfield as a country tank-wagon man, at Columbus as cashier, at Urbana as manager for the Standard Oil Company at that place, and finally at Newark as manager, the latter station being much more important than Urbana. The witness gave the following account of the reasons for his leaving the employ of the Standard Oil Company:

The Standard Oil Company has in Ohio an inspector, Mr. Lockwood, who goes over three States, inspecting the condition of the various stations, the work of agents, etc. The form of inspection report is given by the witness. When this inspector visited the witness during his agency at Newark, at one time the witness was in a bad humor and, not knowing the official position of the inspector, he objected to receiving suggestions from him. This led to his being suspended, although he was told that this was not a discharge. Suggestions have since been made by the Standard Oil Company with a view to taking him back, but the witness is unwilling to return. He objects especially to the practice of deducting from the salary of the agent any losses due to errors, whether of himself or of others.

Mr. Mathews, selling agent of the Standard Oil Company for the central and southern parts of Ohio, testifies in detail in refutation of the evidence of Mr .Clark. He states that Mr. Clark's evidence was obviously prompted by spite, owing to the fact

that he had been dismissed from the service of the Standard Oil Company on account of a shortage in his accounts and not for the reason stated by Mr. Clark in his testimony. The inspector referred to by Mr. Clark having visited the station at Newark was the traveling auditor and had nothing to do with the regular inspecting system. Mr. Clark had been negligent in sending in his regular reports and on investigation was found to be short in his accounts. The final amount of shortage was $231, part of which was made up by Mr. Clark and the remainder by his bondsmen. He would have been indicted by the grand jury for embzzlement save for the fact that the various items taken were small and could not be joined together in the indictment, so that the offense was only petty larceny.

Mr. Mathews testifies further that Mr. Clark never held such responsible position under the Standard Oil Company at various places as he claimed. He had not had the opportunity to be familiar with details of business concerning which he testified.

Neither Mr. Mathews nor any other employe of the Standard Oil Company has made propositions to Mr. Clark with a view to re-engaging him in the company's service. An affidavit by Mr. Foutz to this effect was submitted.

Mr. Clark states that in Ohio no two stations have the same price for oil, and the differences are not due solely to freight rates. At competitive points the prices are considerably lower. Thus in 1898 the price of gasoline at Newark, where there was no competition, was 7½ cents, while at Columbus, under competition, it was 5½ cents. At the same time oil was about two cents cheaper at Marietta than at Newark, although there was no difference in the conditions of competition. When competition has been driven out, prices are raised to the old high level or to one still higher. Thus at Newark at one time oil sold as low as four cents, but afterwards was raised to 13 or 14 cents. The Standard Oil Company, where it has to meet competition, usually keeps oil at a somewhat lower price than its competitors. There may be times when its price is higher, but the average is lower. Many dealers are willing to pay more for independent than for Standard oil.

While Mr. Clark was employed by the Standard Oil Company at Marietta, the company hired a man named Davis to compete with a tank-wagon driver named Curtis, who had been buying oil of the independent Argan Refining Company. He was furnished a horse and wagon and sold oil so cheap that the competitor had to come to the Standard Company to arrange to buy oil from it. The price had been seven cents during this competition, but was then raised to 12 cents. The competitor again began to buy Argan oil, and was again brought back to the Standard by the employment of a Mr. Ebright, who "played the farmer racket" in selling against Mr. Curtis.

Concerning the alleged fraudulent methods of competition at Marietta, O., testified to by Mr. Clark, Mr. Mathews states (substantiating his evidence by a certified transcript from the testimony of William Ebright and by an affidavit of W. A. Reed, local agent at Marietta when Clark was employed there) that Mr. Clark was then only an office and warehouse boy, entirely unfamiliar with the conduct of the business, and that his evidence was untrue and malicious in every particular. The man Davis referred to was not employed by the Standard Oil Company at any time. He was an independent oil peddler and bought oil outright at the ruling market prices from the Standard Oil Company, selling it at prices fixed entirely by himself. The man named Ebright was in precisely the same position as Mr. Davis. It was not true that he pretended to be a farmer or otherwise deceived concerning his character in business.

While Mr. Clark was manager for the Standard Oil Company at Urbana, O., a man named Helmick, whose father had been twenty years a dealer in oil, established a competing business, buying oil from the Cleveland Refining Company. The witness, accompanied by two traveling agents of the Standard, visited Mr. Helmick and threatened him with excessive cuts in prices. Some cuts were actually made, from eight to six cents, and through these and the threats the competitor was forced to give up business and finally went to the poorhouse. He had put up a building to handle oil and this was an entire loss. The witness believes that this excessive competition by the Standard was the cause of his failure, not his own incompetence.

Mr. Mathews, replying to this testimony of Mr. Clark, states that Mr. Helmick bought only one carload of oil from independent dealers, and after he had sold about one-half of it became satisfied that he would lose money on account of leakage and poor quality, and the Standard Oil Company took the remainder off his hands. The Standard Oil Company did not drop prices while Mr. Helmick was in business, nor were threats made by the two agents of the Standard Oil Company referred to by Mr. Clark. Both of these agents submitted affidavits denying Mr. Clark's allegations. Mr. Hurley, a notary public, also submitted an affidavit that he had seen Mr. Helmick and that the latter had declared the testimony of Mr. Clark in reference to himself untrue, especially in regard to the cause of his going to the poorhouse. Another affidavit shows that Mr. Helmick continued in the oil business about two years after the time referred to by Mr. Clark; that he afterwards went to the poorhouse, but that on August 31, 1899, he was employed in a canning factory at Wapello, Iowa. Mr. Cone, a township trustee of Urbana township, furnished an affidavit that he believed Mr. Helmick's going to the poorhouse was due to the extravagance of his family and other domestic troubles. Mr. Powers, a drayman who had hauled oil to Mr. Helmick's building, stated that it was a mere shed built of refuse lumber and not worth more than $10.

Mr. Clark states further that at Columbus, while he was employed by the Standard Oil Company, one

Shoemaker was hired at a regular salary and furnished oil at prices so low that he could undersell representatives of the Cleveland Refining Company. Customers supposed that he was an independent dealer. A boy was also hired to watch the tank cars received by competitors and the amount of oil sold. The prices were then cut so that the competing dealers were forced to agree to maintain prices at a fixed point.

All these statements are denied by Mr. Mathews in detail.

While Mr. Clark was agent of the Standard Oil Company at Newark, a Mr. Donaldson started business, buying oil from the independent firm of Scofield, Shurmer & Teagle. The witness was told that he should have a two weeks' vacation if he would get rid of this competitor. He became friendly with the owner of the shed where Mr. Donaldson stored his oil, promised him work for the Standard Oil Company, and succeeded in buying the shed, in the absence of Mr. Donaldson, for $2.50. He removed the barrels and tanks and had the shed hauled away. While Mr .Donaldson was competing a boy had been hired to follow his wagon and discover his customers. Mr. Mathews, the canvassing agent of the Standard Oil Company, would then visit these customers, test the quality of oil in their lamps, and offer oil at reduced prices. The Standard Oil Company also, after buying the shed, hired the driver formerly employed by Mr. Donaldson and had him deliver oil to Mr. Donaldson's customers. Mr. Mathews sent a letter to the witness complimenting him upon his success in the transaction.

The statement of Mr. Clark as to the manner in which Mr. Donaldson was driven out of business at Columbus is denied by Mr. Mathews, supported by the affidavit of Mr. Hollingsworth. Mr. Clark bought the so-called warehouse, which was only a small shed, about four feet by four, entirely on his own responsibility and without direction from any superior officer. He was reprimanded afterwards for having done so. The price of $2.50 paid was all the shed was worth. Donaldson was not driven out of business by this purchase, but rented a barn and continued thereafter.

6. Statement of Policy by Combination—Mr. Archbold testifies that he has no doubt that the Standard Oil Company, when closely pressed with competition at any point, tries to hold its trade by cutting prices, and would not declare that it had never cut prices below the cost of production, although such a case would be a rare one. Such cutting of prices is the natural law of trade. Mr. Archbold belives that ordinarily the competitors of the Standard begin the fight. He does not consider it advisable in most cases to sell goods at a loss for any purpose, but believes that if prices were cut to cost or below it the Standard Oil Company could endure the strain much longer than a smaller competitor.

Mr. Dodd states, in reply to a schedule of questions, that the prices of refined oil are the same throughout the United States, allowing for cost of transportation, and that they average lower, transportation considered, than in foreign countries. He stated that agents have no authority to make special cuts in special sections of the country, but has no doubt that prices have been cut to meet lower prices made by competitors.

Mr. Page also admits that the Standard tries to keep its trade and makes prices to do so. He presumes that during such competition prices are lower than where there is no competition, to a reasonable degree. But he adds that the Standard's policy is regularly to sell as cheaply as possible in order to increase the volume of business.

Mr. Mathews states that the Standard Oil Company never cuts prices first in any field, but when a competitor reduces prices it does not hesitate to meet the cut in order to hold its business.

Mr. Boyle also states that oil refiners generally, like most other manufacturers, find themselves with surplus stocks during certain years and certain seasons, and hold out inducements to purchasers to take off the surplus at reduced prices. This is the only method, unless a combination can be formed sufficiently strong to hold back goods for higher prices. The Standard Oil Company especially aims to extend its markets in foreign countries, and to do so often sells with little or no margin of profit, especially when it has a surplus production. (This is also admitted by Mr. Archbold.) The Standard doubtless cuts prices for a similar reason in this country from time to time, just as other manufacturers do. The witness has heard that it has the further object in making such cuts of driving out competitors from particular localities, but he has never personally seen such a case, his observation being limited to the oil-producing country itself.

DIFFERENT PRICES TO DIFFERENT DEALERS.

Mr. Clark testifies that it was customary for the Standard Oil Company, at the stations where he was employed in Ohio, to make different prices to different dealers in order to hold their trade, these prices being often based on reports from local agents as to purchases of competitive oil. The witness states various instances, but especially one at Newark, where one dealer was charged seven cents for gasoline and his next neighbor 9½ cents. In another case, Showman Brothers were charged 7½ cents for oil, Mr. Rankin six cents, while Mr. Hagmeier was given rebates on the nominal prices of one cent on gasoline and two on oil.

These charges are denied by Mr. Mathews. The various tank-wagon drivers are not allowed to discriminate between one buyer and another, but must charge all the same price for the same grade of oil. Mr. Clark could not cut the price when he was a tank-wagon driver without paying the difference out of his own pocket. A statement that at Columbus empty barrels were taken back at an exorbitant price in order to hold customers is also false.

It is nevertheless true that at times there may be some differences between different customers, owing to the existence of contracts for furnishing

oil at certain prices for a period of time. It was true that at Newark, while Mr. Clark was there, there were such differences in the price of gasoline, owing to the market advance in the general price, while some dealers remained under previous contracts. The statement specifically made that Mr. Rankin was charged six cents for oil and Showman Brothers 7½ cents is entirely untrue. Mr. Rankin, in fact, was charged 1½ cents per gallon more than Showman Brothers, because he bought oil in barrels instead of in bulk, but an equivalent amount was refunded when the barrels were returned empty. Mr. Hagmeier was allowed a rebate of one-half cent per gallon on both oil and gasoline under a special contract, but did not receive such rebates as one or two cents. An affidavit of Mr. Hagmeier to this effect was presented, and also an affidavit stating that Mr. Clark had secured his previous statement acknowledging the receipt of rebates under a pretenes that it was necessary to explain a shortage in his accounts.

The witness has never known of discriminations between different buyers under such special contracts which amounted to more than one-half cent per gallon. Such rebates are granted in consideration of an agreement that the dealer shall buy exclusively from the Standard Oil Company. Differences in prices of lubricating oil also exist under special contracts, being largely conditioned on the quantity of oil purchased and on the expense of delivering it.

WATCHING OF COMPETITORS' BUSINESS.

1. Evidence of Opponents of Combination—Several witnesses testify to a practice of the Standard Oil Company of securing information as to the business of competitors, their shipments, customers, etc. It is believed by some that the employes of competitors are hired to furnish such information.

Thus Mr. Westgate testifies that the Standard Oil Company keeps an accurate record of every barrel of oil that the independent refiners ship to each place. The information may not be received from the local freight offices, but perhaps from junction points. The witness knows that this is the case because his customers have told him that traveling men of the Standard Oil Company have informed them that they knew of shipments coming. The traveling men report whether dealers buy Standard or independent oil, and the reason. Customers of independents will then sometimes be offered oil under cost.

Mr. Monnett testifies that the Standard Oil Company frequently employs agents to follow up rival companies, ascertaining their customers, and then seeking to take them away. They drive competition out from certain places and are then enabled to charge rates sufficiently high to establish a fund for attacking competition elsewhere.

Mr. Monnett further states that testimony was given in the Ohio suits to show that clerks of competitors, for example, of Scofield, Shurmer & Teagle, of Cleveland, had been bribed to furnish information as to the amount of oil shipped, names of customers, and other details of the business of these competitors. In this case the person bribed disclosed the fact to his employer.

Mr. Emery believes that the Standard Oil Company still receives statements from railway companies as to shipments by others, such as were agreed upon in the contract with the South Improvement Company. He states, as an example of the practice, that about a year ago he shipped two barrels of oil, along with a larger shipment, to a gentleman in Dubois, Pa. These barrels were not placed in the car until after business hours, and no one knew of their shipment. But before the oil reached Dubois the purchaser was met by an employe of the Standard Oil Company, who complained of the fact that he was dealing with Mr. Emery. Other cases where information must have been given by railway officers are numerous.

Mr. Gall, a wholesale dealer in refined petroleum at Montreal, testifies that the Standard Oil Company frequently sent a man to open tank cars shipped by independent refiners to the Gall-Schneider Company, to see exactly what they contained. The witness was recently able to detect a man in the act, and the explanation that it was due to a mistake is not to be believed. A representative of the Standard Oil Company at an earlier period jokingly told the witness the numbers and contents of several cars of oil which had just been received.

Mr. Gall testifies further that it is common for the Standard Oil Company to send a man to watch the delivery of oil, and then to send their own agents to the purchasers, cutting prices, and otherwise seeking to prevent competitors from securing trade.

Mr. Davis has been engaged in an independent refinery in Marietta, O. At one time his shipping clerk was approached by an agent of the Standard Oil Company, who offered to pay him for reporting the names of persons to whom oil was shipped, the invoice price, etc. The witness believes that every barrel of oil he shipped from his works was made known to his competitors. Their traveling men would then follow each shipment and often it would be necessary to reduce the price in order to retain the customer. In such cases the consumer probably received no benefit from the lowered prices, but only the dealer.

Mr. Clark testifies that, while agent of the Standard Oil Company, he was required to make reports each week of the business of competitors, the customers supplied by them, the prices, etc. On the basis of these reports, the general manager at Columbus would send instructions as to methods of holding or taking away customers. Sometimes the manager would come himself and make special arrangements as to prices.

The following letter shows the practice of requiring reports as to competition:

May 25, 1897.

Dear Sir:—I forward to you today a supply of blanks, same as sample herewith inclosed, which is to take the place of the little slip that has formerly been used for reporting daily competitive oil. Will you kindly fill out one of these blanks weekly, commencing with June 1, and whenever the month ends in the middle of the week, make out one on the last day of the month for the portion of the week not covered in the last week you report? Enter upon this report all competitive oil or gasoline that you have been able to locate during the week, and if during the week you have been unable to locate any competitive shipments, then write across the face of the blank "Nothing to report" and mail it to this office. Be sure to mail it whether you have competitive receipts to report or not. If there is anything about this report that you do not understand, please confer with me at once, as it is very important that it should be made out promptly and forwarded regularly. Trusting that I will have your hearty co-operation,

I am, yours very truly,

B. A. Mathews.

W. H. Clark, Newark, O.

2. Reply of Standard Oil Witnesses—Mr. Archbold declares that it is not the policy of the Standard Oil Company to obtain information from employes of its competitors, and that if through the action of some overzealous employes this were attempted it would be disapproved. The company does naturally seek information from its own agents as to the business of competitors, but none which they cannot rightfully secure.

Concerning the watching of the business of competing dealers, referred to by Mr. Clark, Mr. Mathews testifies that it is the practice of the Standard Oil Company to ask its salesmen and agents to keep their eyes open and inform the company as to those from whom different dealers are buying, and as to the general condition of business. This is required as much for the sake of ascertaining that the agents are attending to business as for any other purpose. The witness does not recall any case where anyone has been employed to follow a competitor's wagons and find out at what prices he sells. In no case has the Standard Oil Company secured reports as to the business of rivals from employes of those rivals.

ALLEGED FRAUD AND DECEPTION BY STANDARD.

1. Different Grades From Same Tank—Mr. Clark states that while he was agent of the Standard Oil Company at various places in Ohio he made it a practice, under direction of the company, to sell nominally different grades of oil at different prices from the same tanks. There are only three different grades actually handled—the Diamond White, Water White and Eocene. As many as eight different prices are made with from one-fourth to one-half cent difference between them. Thus at Marietta prices ranged from 6 to 10½ cents. If a customer considered a certain price too high he would be offered a lower grade at a lower price, but the oil would be drawn from the same tank. At Springfield a man was hired to run a tank wagon, but resigned when directed to carry out this practice. If a customer demanded oil direct from Cleveland, barrels would be painted red and branded with a stencil sent from Cleveland. At Newark the oil was sold directly to tank wagon men, and they learned from an employee of the company the practice of selling different grades from the same tank. Each customer is thus satisfied and given what he wants.

Mr. Mathews denies in detail all the allegations of Mr. Clark concerning fraudulent practices in selling nominally different grades of oil at different prices from the same tanks, and submits affidavits of W. A. Reed and C. W. Foley, agents of the Standard Oil Company, at the different places where Mr. Clark was employed, and of W. W. McMahon and C. M. Taland, tank-wagon drivers at Springfield, stating that no such practices have been at any time resorted to either by the Standard Oil Company directly, or, through its suggestions, specific orders were always given prohibiting such deception. The facts are that at Marietta, for example, the company has really three different grades of oil, but sells them under several different names, although at precisely the same price for oil of the same grade. Thus Water White, Red Star Water White, Silver Light, and Crystal are simply trade names for the one grade, water-white oil. They have been established by custom in different localities to meet local demands. At a few points near Marietta, Eocene, a better grade of oil, is furnished customers under the name of Hyperion, on account of the saving in freight in doing so.

Mr. Mathews also submitted affidavits of C. W. Foley and R. A. Foutz, stating that the tank-wagon driver at Springfield, who, as stated by Mr. Clark, resigned because he did not desire to deceive in the quality of oil, really resigned because he did not like tank-wagon work and for no other reason, and had so stated to the affiants.

The quality of oil does not depend on the degree shown by the fire test. The three grades sold by the Standard Oil Company all have the same fire test of 120 degrees by the Foster cup. Oils may be of exactly the same fire test but different in illuminating power, and the latter determines quality.

Mr. Westgate incidentally gives testimony which may corroborate Mr. Mathews. He states that in his refinery he manufactures five grades of oil, varying in price from 3.90 cents to 4.50 cents, at present. Special brands are sometimes put upon oil to suit different customers, but this does not imply any deception as to the quality. The witness bills his oil at the names and prices of his own brands, but affixes any name desired.

2. Deceptive Tests.—Mr. Clark also states that the oil sold by the Standard Oil Company in Ohio is mostly refined from Lima oil, and of inferior quality, smelling of sulphur. A German has invented a method of brushing the sulphur out of the

oil. The Standard Company controls this patent, but the method is exceedingly expensive. The Standard Oil Company seeks to deceive customers as to the quality of its oil by unfair tests. The witness has been directed orally by his superiors as to methods of making such tests, but has no written evidence. The deception is accomplished largely by turning the wick in the lamp high when Pennsylvania oil is being used and low when Ohio oil is being used. The oil handled by independents is mostly Pennsylvania oil and of higher quality.

Mr. Mathews denies that the Standard Oil Company resorts to unfair tests of lamps to show the superior quality of its oil. Competitors in Ohio had been marketing oil at a reduced price containing some oil made from Ohio crude. Dealers sometimes mixed these inferior oils with oil furnished by the Standard Company, and the latter was forced to visit customers, especially retail storekeepers, and show by actual tests the superior quality of the Standard's oil. It would have been entirely impossible to deceive by turning the flame higher in one case than in the other, as alleged by Mr. Clark. The various agents and employes of the Standard Oil Company, to whom Mr. Clark specifically refers as having knowledge of frauds in lamp tests, all submitted affidavits denying that such frauds had been practiced and stating that similar lamps, burners, wicks, and chimneys were used in testing different kinds of oil, and that at the beginning of the test the height of the flame in each lamp was the same.

3. Adulteration of Lubricating and Similar Oils—Mr. Clark testifies that at Marietta he mixed gasoline worth 7 cents per gallon with turpentine worth 38 or 40 cents, under direction of his superior, in order to cheapen it. At Columbus, so-called boiled linseed oil was made by heating raw oil to 125 degrees and adding a small quantity of Japan drier. Miner's oil was made by mixing 2 gallons of "miner's stock," which costs about 6 or 6¼ cents, with 3 gallons of cotton-seed oil. The product sells at from 22 to 34 cents. Paraffine oil was sent from Cleveland in blank barrels, and these were labeled as different qualities of machine or rubbing oil and sold at different prices without change of quality. The witness is not aware that the same methods have been used by independent refiners.

Mr. Mathews denies in detail these charges, and submits the affidavit of Adam Paulus, mixer at Columbus, to support his evidence The dryer used in making boiled linseed oil at Columbus was pure linsed-oil dryer, which cost 10 cents per gallon more than linseed oil and increased the cost of the prepared oil, and the oil was heated to 225 degrees. The statement that miner's oil is made by compounding cotton-seed oil with 40 per cent of petroleum is false. The Ohio law, which is rigidly enforced, would absolutely prevent more than about 14 per cent of petroleum being used. The price of miner's oil is regulated by the price of cotton-seed oil, running about 2 cents per gallon below. The prices charged for miner's oil are lower than stated by Mr. Clark.

The statement that lubricating oil is received in barrels with blank heads and shipped out to meet the requirements of the trade without regard to the actual contents is untrue and absurd.

The statement that gasoline was mixed with turpentine is also false. Any buyer can detect such adulteration of turpentine instantly by the use of an ordinary hydrometer, which all druggists keep.

Mr. Davis gives evidence tending somewhat to conform that of Mr. Clark. He states that most refineries have a department in charge of an expert who compounds mineral oils with animal oils and makes various extractions from paraffine. There are wide differences in grade of such compounded oils, and there is much opportunity for experience and skill. It is possible for oils of practically the same quality to be sold at very different prices. The witness believes that the Argan Refining Company sold a quality of lubricating oil at 70 or 80 cents which was practically identical with that sold by his company at 22 or 23 cents.

4. Copying of Brands, Etc.—Mr. Westgate testifies that he is manufacturing a high quality of oil known as Sunlight. The Standard Oil Company has copied this brand for sale in New York State, putting its own name on the barrels. At Fulton, N. Y., the Standard Oil Company established two retail peddlers to compete with one who had been purchasing oil from the witness. They were furnished with oil refined by the witness, and it was offered to customers, under the brand put on it by the witness, at a reduced price. This oil was probably obtained from the Merchants' Refining Company of Buffalo, to which a shipment had been made a little time before by the witness.

Replying to the above statement of Mr. Westgate, Mr. Archbold testifies that on careful investigation he finds that, so far from the Standard Oil Company using Mr. Westgate's brands, the opposite is the case. The Standard had long been using yellow barrels in certain territory, and when Mr. Westgate began to do business there he used the same color, with a view to thereby furthering his trade. Mr. Archbold denies absolutely the charge of copying brands.

Mr. Davis also testifies that the refinery in which he was interested at Marietta made special brands of oil for particular customers. It sometimes found that these names were used by other refineries, apparently for the purpose of taking away trade. At one time a shipment of oil to the Cleveland and Marietta railroad was made, and it was later discovered that several of the barrels contained 5 or 6 gallons of water each. These had the brand of the witness's refinery, but he has the impression that they had been substituted by competitors for the purpose of injuring his trade, or else that the water had been put in by a competitor.

COMPETITION IN FOREIGN MARKETS.

Mr. Lee testifies in some detail as to the conditions of competition in foreign markets, especially

Germany, his evidence being confirmed by less detailed statements of Mr. Westgate.

Prior to 1895 the Standard Oil Company had cut prices abroad so that export oil was sold in New York below the cost of crude at the refinery. The independents had long been marketing oil in Germany through a man named Poth, but he sold out to the Standard in 1896. The Standard used unfair methods of competition, tying up all the tankage. To enable the independents to compete, the Pure Oil Company was organized, and the refineries agreed to sell it oil at cost, leaving to it the marketing of oil abroad. It erected stations at Hamburg and Rotterdam, is erecting one at Mannheim, and it has rented one at Amsterdam. It has its own tank steamers and tank cars, and is now doing a profitable business, prices in Europe being reasonable. Mr. Lee states, though he does not clearly explain the method, that the German government prevents excessive competition, because it will not allow business to be conducted at a loss. This statement is made on the basis of experience of Mr. Poth and of the agents of the Pure Oil Company.

Mr. Emery also describes the competition of the Standard Oil Company with the independents in Germany. After the Standard had bought out Mr. Poth, Mr. Emery was sent to Germany by the independents, and immediately let a contract for the construction of tanks in Amsterdam. In Hamburg the legislative body passed a law furnishing ground on which to build tanks. The Russians suffered equally with the Americans from the competition of the Standard Oil Company.

Mr. Emery likewise testifies that the government of Germany in some way secures to all competitors fair conditions and prevents unfair competition, but he is not certain as to the precise method by which this is done. In 1895 he went with Mr. Poth, the agent of the independents in Germany, before the imperial ministry at Berlin to make complaint of the fact that oil was being sold on the Rhine at from 1½ to 2 cents a gallon less than on the Elbe. Mr. Emery also had a conference at St. Petersburg with the prime minister of Russia, and with Mr. Nobel, the great Russian oil producer. Their views agreed with those of the independent American refiners—that they were suffering unfair competition in Germany, and that they desired to see it rectified. The independents have secured an official permission from the German government to sell oil, being required to file their American charter and being subject to a certain supervision, the precise nature of which Mr. Emery does not know.

Mr. Archbold declares that Mr. Lee's statements concerning governmental control of competition in Germany are "silly."

According to Mr. Archbold's testimony, below quoted under the heading "Crude oil," the prices of refined oil are constantly kept in substantially the same relation to those of crude, although there are sometimes variations one way or the other. In reply to a question as to whether refined oil was not sometimes sold at the seaboard at less than the price of crude, Mr. Archbold said: "I should say that is a very exceptional case. I do not recall. * * * In competing with the Russians at certain times for certain markets, we have made prices for refined that were as low as the crude product, * * * but they have been very exceptional cases, and it is not the case today." These cuts have been made especially in the far east, and the company has relied on the profits from by-products to offset them.

OUTPUT AND PRICES OF REFINED OIL.

PROFITS, COST OF REFINING, ETC.

MONOPOLISTIC CHARACTER OF THE STANDARD OIL COMPANY.

1. Generally—There is a general consensus among the opponents of the Standard Oil combination that it has a sufficient control of the markets for refined oil to practically constitute a monopoly. The business of independent refiners is confined to a few sections of the country, and the larger proportion of their oil is sold abroad. It was testified that the Standard Oil Company now controls from 90 to 95 per cent. of the business of refining. Mr. Lockwood declared that the independent refiners, including the Ohio field, handle about 4 per cent. of the oil product.

Mr. Phillips declares that, although the Standard Oil Company has no legal advantages under the laws incorporating it, it has practically been able to monopolize the oil business. Controlling at least 80 per cent. of the business of refining, it is able largely to fix prices. The witness believes that but for the Standard the public would have been better served, at lower prices.

Mr. Archbold submitted, in reply to the evidence of Mr. Lockwood and others, the following statement showing the amount and proportion of oil refined in the United States by the Standard Oil Company and by other refiners during the years 1894 to 1898, inclusive:

Year	Standard Oil Co.		Others		Total
	Barrels	Per cent of Total	Baarels	Per cent of Total	Barrels
1894...	18,118,933	81.4	4,145,232	18.6	22,264,165
1895...	18,348,051	81.8	4,084,720	18.2	22,432,771
1896...	16,341,161	82.1	3,569,719	17.9	19,910,880
1897...	18,141,479	82.4	3,876,706	17.6	22,018,185
1898...	19,999,939	83.7	3,914,999	16.3	23,914,938
Total.	90,949,563	82.3	19,591,376	17.7	110,540,939

2. Competing Refineries—Mr. Davis testifies that there are about 12 or 15 independent refineries in Pennsylvania. They are not formally combined, but have common interests in pipe lines. They refine about one-tenth of the oil.

Mr. Lee and Mr. Emery testify that the various independent refiners are not at all directly connected with one another, although each owns stock in the various independent pipe lines and in the Pure Oil Company, which markets a part of their production abroad. It has been proposed to combine the refineries completely. The Producers and Refiners Pipe Line sells oil to the independent refiners, the United States Pipe Line conveys their oil to the seaboard, and the Pure Oil Company buys oil from them. Any dividends of these companies go to the refiners as far as they are stockholders. The separate refiners market their own oil to a considerable extent. Some of them have stations and special agents, but most sell to ordinary merchants.

Mr. Emery adds that the various independent refiners compete actively with one another, both in the domestic and in the foreign trade. Although part of the export oil is sold through the Pure Oil Company, the refiners also sell separately in almost every European country.

Mr. Monnett testifies that the Standard Oil Company has practically no opposition in Ohio from competing pipe lines or refineries. He believes that Scofield, Shurmer & Teagle have some arrangement by which they are allowed to survive. Other apparently competing companies are under the control of the Standard Oil Company in one way or another.

Replying to this testimony (on the hypothesis that Mr. Monnett includes in his statement the production of crude petroleum, as well as its transportation and refining), Mr. Archbold testifies that in the Lima district alone there are more than 1,600 companies, partnerships and individuals engaged in producing oil, in which the Standard Oil Company has absolutely no interest whatever. There are eight large active concerns refining oil, which the witness names, besides several smaller concerns. These companies during five years, from 1894 to 1898, have done a business of 14,647,949 barrels.

Mr. Lee refers to the list of independent refineries published in the report of the Committee on Manufactures in 1888. Of these he is aware that the following have been absorbed by the Standard Oil Company: New York, Borne, Scrymser & Co., Lombard, Ayres & Co.; Pittsburg, Bear Creek Refining Company, Globe Refining Company, Oil City, Keystone (torn down); Franklin, most of the refineries shut down; Bradford, no refineries now in existence; Parkersburg, one absorbed by the Standard; Titusville, Schwartz's, National, and Western refineries combined into Union Refining Company, absorbed by the Standard and torn down, also International Works torn down; Philadelphia, Bosshart & Wilson. The Standard Oil Company has also leased a number of refineries at high rates and then shut them down, thus paying a bonus for idleness. The purpose is to check competition.

Mr. Davis was largely interested in a small refinery at Marietta, O. It handled chiefly Macksburg oil, which is rich in paraffine and lubricants. These had been sold in considerable amounts to the Baltimore & Ohio Southwestern Railroad, but its managers became interested in the Argan Refining Company, at Marietta, and the withdrawal of its patronage, together with discriminations in rates, which the witness believes to have existed, led largely to the closing of his refinery. A further difficulty was that the Buckeye Pipe Line Company charged 35 cents per barrel for piping oil from wells owned by the witness and his associates in the Corning field, 40 miles distant. The railways also charged a similar rate for hauling crude oil from the field to the refinery.

3. Colorado Refineries—In evidence before the sub-commission on mining in Colorado, it was brought out that the refineries handling the product of the oil field in that State are forced to sell all their output to a distributing company, which is only a branch of the Standard combination. Mr. Archbold, when questioned on this subject, stated that there was certainly no compulsion, as had been charged, upon the refiners to sell to the Standard. He declared that he was not familiar with the subject, but the act must be voluntary. Mr. Boyle also stated that he was not familiar with the situation in Colorado, although he has understood that the Standard does not itself refine the product in that field, but buys the output of the other refineries.

4. Control by Standard in Canada—Mr. Gall, who is a wholesale oil dealer at Montreal, testifies that the total amount of refined oil products manufactured in Canada in 1898 was 21,153,192 gallons, of a value of $1,723,293. The Standard Oil Company in July or August, 1898, secured complete control of all the refineries in Canada, of which there were five then in operation and four temporarily closed. All of these except the former Imperial Oil Company plant and one at Sarina have been dismantled. Mr. Gall believes it possible, however, that these existing refineries have almost as great capacity as the old ones, and sufficient to refine the entire Canadian production of crude oil. In fact, owing to the tariff of 5 cents per gallon on the importation of oil, it is much cheaper for the Standard to refine oil in Canada.

Mr. Gall testifies further that his company formerly handled largely Canadian oil, but that since the Standard Oil Company secured control of the refineries there it has been impossible for his company or any other organization to obtain oil from the Standard Oil Company except by promising to buy exclusively from it. The Standard Oil Company has two or three times sent men to the Gall-Schneider Company making such a proposition for exclusive patronage of the Standard.

Mr. Archbold testifies that the condition of the refining business in Canada has been very much disorganized; that the Standard Oil Company has comparatively recently entered the field, and that it now is doing, he thinks, about 75 per cent. of the refining in Canada.

5. Purchase of Refineries by Standard Oil Company—Mr. Lee, Mr. Westgate and Mr. Emery all testify concerning the recent attempts of the Stand-

ard Oil Company to buy out competing refineries. One main purpose in this attempt is to secure the stock held by those refineries in the United States Pipe Line and the other independent pipe line organizations. Quite high prices have often been offered for these properties, but in most cases the owners have declined to sell, largely as a matter of sentiment, even though they expected to be driven into bankruptcy from long-continued losses through the competition of the Standard Oil Company. Offers have been made, Mr. Lee believes, to all of the independent refineries.

Three large independent refineries in the oil regions have been bought out since 1895 by the Standard Oil Company and have been dismantled. One of these belonged to Mr. Ramage, another was the National Refining Company, and the third the Continental Refining Company. All of these were first-class and modern, but they have been entirely dismantled. To destroy them thus was a waste of capital which it had taken years to build, and the purpose of the Standard Oil Company was undoubtedly to destroy their competition as well as to injure the independent pipe lines. All of these refineries had contracts to take oil from these pipe lines, and the withdrawal of their patronage has involved a serious loss, since it costs little more to handle a larger quantity of oil through the pipe lines. The Standard declined to sell any of the material of the dismantled plants to other independent refineries.

Mr. Archbold admits that the Standard Oil Company has frequently purchased and dismantled plants of its competitors.

"We have at times bought refineries with the expectation of succeeding to the volume of business done by them. We have universally replaced the capacity of these refineries to better ones and better-equipped construction at more favorable points. We would not buy refineries and dismantle them for the pleasure of doing it."

"Q. Incidentally, in connection with that, it might be a more convenient way of holding your market in a locality where competition would figure?—A. Precisely."

Mr. Archbold testifies further that the purchase of refineries in Titusville was no exception to the above statement. The Standard Oil Company utilized the property of one of these refineries in establishing a plant in Puerto Rico and of another in establishing one in Kansas. There is at all times an excess of capacity in the refineries of the country, and the sole purpose in abandoning any plant is to conduct the business at a point where it can be more economically done.

Mr. Davis states that the Argan Refining Company, at Marietta, was recently leased to one of the branches of the Standard Oil Company at 6 per cent. on $200,000 for ten years. The owners have since practically sold out to the same parties, this apparently being due to the suit brought against them for joining the trust. The witness believes that he could put up as good a plant for $75,000, but he does not think that the Standard Oil Company often pays high prices for competing plants. He believes that Scofield, Shurmer & Teagle are making profits.

6. Control of Competition by Pipe Lines—Several witnesses testify, directly or by implication, that one of the chief means by which the Standard Oil Company has been enabled to drive out competition has been its control of the pipe lines for handling crude oil. Compare on this subject the testimony under the headings: Pipe Lines; Railway Discriminations.

Mr. Davis, who is interested in wells in the new Corning field near Marietta and in a refinery at Marietta, testifies that the price of the Corning oil is fixed by the pipe line at 17 cents less than Macksburg oil, although it is in some ways of as good quality. The witness desired to pipe oil from his wells to the refinery at Marietta, but was charged 35 cents per barrel pipage, the ordinary rate throughout the oil fields being 20 cents. Practically he was forced to sell oil at the Corning field to the pipe line company and to buy from it oil of about the same quality at 17 cents more. This was one means used by the Standard Oil Company, apparently, to drive his refinery out of business.

7. The Matthews Case—Mr. Lockwood refers to the case of Mr. Matthews, of Buffalo, and the alleged conspiracy of the Standard Oil Company to blow up his refinery, but does not state the facts in detail. He refers to the fact that Mr. Matthew's partner, who had been bribed to betray him, was kept under cover for four years, with an assumed name, but finally confessed to Matthews. Matthews secured verdicts for $270,000 against the Standard Oil Company in civil damage suits, but his creditors, under the receivership to which he was forced to submit, had to settle for $17,000.

Mr. Archbold submits a detailed statement of the facts concerning the case referred to by Mr. Lockwood. In 1881 Matthews and two others were confidential employes of the Vacuum Oil Company, whose chief officers were H. B. and C. M. Everest. The Standard Oil Company was interested in the stock of this company, but had no control of its affairs. Matthews and his associates conspired to leave the employ of the Vacuum Oil Company and to establish a small business in Buffalo, taking advantage of their knowledge of the processes and patrons of the Vacuum Oil Company, and expecting that that company would be forced to buy them out. The Vacuum Company brought suit for infringement of its patents. At this time one Miller, who had left with Matthews, was re-employed, at his own solicitation, by the Vacuum Company. Later, however, he again left this company, went over to Matthews, and through his statements an indictment was brought by the grand jury against the directors of that company, charging it with conspiracy against the Buffalo concern. The balance of evidence in the case was overwhelmingly in favor of the Vacuum Company. The judge held that there was not any evidence against the directors belonging to the Standard Oil Company and directed the jury to acquit them, but Messrs. Everest were

held guilty by the jury, plainly under the influence of the plea of the district attorney. Mr. Archbold declares that all the charges concerning the attempted blowing up of the Buffalo works are the purest fiction, and submits a copy of an affidavit signed during 1888 by six of the jurors in the case, stating that it was not their intention individually, nor, as they believe, the intention of the jury as a body, to hold the defendant guilty of conspiracy to destroy the Buffalo works, but that the conviction was based on the enticement of Miller from the employ of that company. These jurors also recommended that the punishment be limited to fine without imprisonment. A note is appended to the signature of one of the six, saying that he swore to the recommendation only.

The statement that Matthews secured civil verdicts for $270,000 is untrue. He brought a suit for $20,000, and the judge set aside the verdict of the jury granting that amount as excessive. He later brought suit for $250,000, which was never brought to trial. Mr. Archbold does not know concerning any settlement that may have been made of this suit out of the courts.

EFFECT OF COMBINATION ON PRICES.

1. General Statistics—All the witnesses testifying in opposition to the Standard Oil combination express the opinion that it has not reduced the price of refined oil as compared with crude oil to any such degree as would be the case under open competition. They especially argue that care must be exercised against the fallacy of failing to distinguish between the reduction of the price itself, which depends largely on the price of crude oil, and that of the margin between refined and crude. The reduction of this margin is generally admitted, but it is declared to be by no means commensurate with the improvements in the processes of refining. The greatly improved uses of by-products are especially pointed out as having made possible a much greater reduction in prices.

It is to be observed especially that the prices of refined oil given in the tables ordinarily quoted are the export prices at New York. Export oil is of a somewhat lower grade than the water white oil used in this country.

According to Mr. Boyle's testimony, there are no satisfactory records showing the price of water white oil in this country. The price varies from place to place according to the cost of transportation, special contracts, etc. The witness believes that if it were possible to find some one standard market in this country where a record has been kept of the prices of a standard grade, such as water white oil, from year to year, these figures would give a fair basis for judging the influence of the Standard Oil Company upon American consumers. Cincinnati was suggested as a point where such records had been to some extent maintained.

2. Statements of Opponents of Combination—In addition to the general opinions, above referred to, as to the effect of the Standard combination on prices, specific statements were made as follows:

Mr. Lee believes that the cost of refining has fallen during the past 20 or 25 years from 2½ cents to one-half cent per gallon, while the margin of difference between crude and refined has fallen little. The prices for refined oil fixed by the Standard are not based on the cost of refining or of crude oil, but are entirely arbitrary. To a considerable extent, probably, it sells oil ahead and afterwards puts up the price of crude, so that its competitors will not be able to meet its prices for refined.

Mr. Rice declares the claim that the Standard Oil Company has reduced the price of refined oil to be absurd. Mr. Thurber's comments on this point pay practically no attention to the influence of the price of crude oil upon refined. There was a reduction in the price of refined oil from 6½ cents in 1861 to 26½ cents in 1870, before the Standard Oil Company came into existence. Mr. Rice also dwells upon the great difference between the price of export oil and that which domestic consumers have to pay. During the severe competition in foreign markets in 1896 the price of refined oil to retail dealers in New York was 9½ cents per gallon, and that of export oil 4½ cents per gallon. In 1892 oil was selling in Texas, Utah, Idaho and other Western States at four times the export price, and in many nearer States, such as Missouri and South Carolina, at double the export price.

Mr. Page declares that it is unfair for Mr. Rice to compare the export prices of oil, which are prices practically at the mouth of the refinery, with those at distant points, where the freight rates and expenses of distribution are high. He says that it is the general policy of the Standard to reduce the cost of refining in every way and to sell as cheaply as possible with a view to increasing the demand of the consumers by lower prices.

Mr. Westgate testifies that the reductions in the price of refined oil are not due simply to the advantages of the Standard Oil Company in production. In the early days the by-products—benzine, gasoline, etc.—were entirely worthless. They constitute about 20 per cent. of the crude product and are now worth about as much as refined oil. The quotations of prices ordinarily given are those in barrels at the seaboard. The barrels were formerly worth $2 or $3, now 88 cents, which makes a difference of about two or four cents per gallon in the price of oil. The export price, moreover, gives no information as to the average prices received in this country. When a cut is made in the export oil it may easily be offset by increasing prices of domestic oil. Nevertheless, the witness believes that the Standard Oil Company employs the best brains in manufacturing oil and has brought forward many improvements and inventions. But if the company now possesses any superior methods, the independent refiners do not know it. The independents can produce as good goods, and as economically, the witness believes, as the Standard Oil Company.

Mr. Emery believes that the people generally would get oil at 50 per cent. less than at present if there were active competition over the entire country. In another place he estimates that European consumers get their oil, quality considered, 25 per cent. cheaper than the average American consumer.

The witness has bought refined oil in California in cans at 20 cents per gallon, of precisely the same quality that he was selling at his factory in Pennsylvania of 4½ cents. Similarly he has bought gasoline at 25 cents per gallon of a kind which he was selling at 4 cents. The freight, according to open rates, from Pennsylvania to the Pacific coast, is about 6½ cents per gallon, allowing for leakage and other losses, so that oil might be sold there at from 10 to 12 cents per gallon. The witness does not know what proportion of the prices charged was the retail dealer's profit.

Mr. Monnett admits that the Standard Oil Company has taken advantage of various improvements in production and transportation—pipe lines, tank cars, development of by-products, etc.—but declares that it can no more claim to have reduced prices by its own efforts than to have reduced the price of calico from 75 cents to 4½ cents per yard. It has been profiting by many millions through non-competitive prices, notwithstanding such general decrease in prices.

3. Canada—Mr. Gall submitted a statement of the prices which he paid for refined oil at St. Johns, Quebec, before and after the Standard Oil Company secured control of the refineries of Canada (August, 1898). The price, delivered, ranged from 11 to 14¾ cents between September, 1892, and June, 1899. At the latter date it was 13½. Since then the Standard Oil Company has raised the price to 17½ cents. The price of crude oil in Canada has not risen with such rapidity as in the United States. During 1898 it stood at $1.40 per barrel, and in June, 1899, at $1.45. It has since been raised to $1.60, but this represents an increase of only one-half cent per gallon during a time when refined has been raised four cents. The increase in the price of crude has been made with a view to encouraging production, since it is cheaper for the Standard to refine Canadian oil, on account of the tariff on importation.

Mr. Gall attributes the high prices of oil in Canada largely to the tariff on refined oil, which is now five cents per gallon, having been reduced somewhat by the last Conservative government in 1896. The present Liberal government has promised to remove the tariff altogether, but has so far failed to do so. The tariff is excessively high. The cost of Ohio oil at Toledo ranges from three to five cents, so that the tariff is fully 100 per cent. The rates on other commodities under the Canadian tariff are from 10 to 50 per cent. The only remedy for the monopoly of the Standard Oil Company and the maintenance of excessive prices is the removal of this duty.

Owing to the likelihood of the removal of the Canadian tariff on oil, it is considered a very risky investment to establish a refinery there now, since without the duty it would be entirely unprofitable. Nevertheless, the Standard Oil Company has made enough profit from the Canadian business to cover the cost of the refineries it purchased.

4. General Reply of Standard's Defenders—Replying to the above testimony that the Standard Oil Company has not lowered prices to consumers, Mr. Archbold referred to the table showing the comparative prices of crude and refined oil since 1870 as proving the contrary. He also submitted the following tables showing the average prices of oils in New York, Chicago and Cincinnati as proving the same point:

Average prices received for deliveries of standard white illuminating oils at New York City, Chicago, Ill., and Cincinnati, Ohio, during years 1885 to 1899, inclusive.

[Prices given are cents per gallon in bulk, exclusive of the package; 2½ cents per gallon added will give average price, including barrel.]

NEW YORK CITY.

MONTH	YEAR														
	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.
January	6.16	6.40	5.63	5.39	5.62	4.66	4.47	3.86	5.30	4.03	4.50	4.99	3.30	3.05	4.28
February	6.09	6.47	5.52	5.49	5.57	4.87	4.44	3.77	5.01	4.00	4.42	4.83	3.31	3.09	4.34
March	5.96	6.12	5.45	5.44	5.44	4.63	4.42	3.88	4.87	3.73	4.50	4.78	3.43	3.80	4.01
April	6.03	5.90	5.09	5.55	5.17	4.54	4.48	3.77	5.42	4.92	6.53	4.49	3.53	3.62	4.08
May	6.69	5.89	5.21	5.54	5.01	4.40	4.44	3.57	5.33	4.26	4.96	4.09	3.54	3.62	4.05
June	6.02	5.59	4.73	5.56	4.82	4.32	4.18	3.08	5.10	4.73	4.55	4.40	3.55	3.53	3.98
July	5.88	5.76	4.85	5.47	4.81	4.72	4.13	3.29	5.07	4.29	4.49	3.60	3.31	3.96	....
August	6.08	5.65	4.71	4.52	4.81	4.81	3.96	3.25	5.09	3.88	3.79	3.47	3.30	4.05	....
September	6.11	5.62	4.67	4.73	4.78	4.81	4.08	3.26	4.66	3.87	3.80	3.32	3.14	4.02	....
October	6.35	5.46	4.61	4.81	4.72	4.85	3.97	3.27	4.48	3.87	3.81	3.70	3.04	4.22	....
November	6.51	5.41	4.67	5.03	4.83	4.87	3.99	4.09	4.34	3.81	4.65	3.74	3.05	4.10	....
December	6.47	5.43	4.94	5.10	4.77	4.69	3.70	4.37	3.71	3.78	5.06	3.44	3.25	4.15	....
Total year	6.21	5.77	5.01	5.01	5.01	4.67	4.16	3.61	4.78	4.07	4.56	3.96	3.31	3.79	....

CHICAGO, ILL.

January	4.83	6.08	4.88	5.31	5.13	5.03	4.05	3.82	3.51	3.58	3.17	4.99	3.06	2.77	3.18
February	4.88	6.00	4.90	5.51	5.22	4.83	4.34	3.72	2.63	3.69	3.69	4.52	3.00	2.82	3.80
March	5.07	5.56	4.71	5.40	5.23	4.81	4.04	3.74	3.57	3.57	4.08	4.12	2.99	2.97	3.60
April	5.00	5.37	4.74	5.13	5.17	4.81	4.01	3.38	3.47	3.54	4.85	3.89	3.03	3.09	3.53
May	4.93	5.19	4.68	5.03	5.07	4.94	4.08	3.28	3.75	3.24	3.91	3.75	2.84	3.04	3.52
June	4.86	5.02	4.70	4.93	5.07	4.82	4.06	3.28	3.70	3.51	4.06	3.47	2.79	3.04	3.52
July	5.20	4.98	4.59	4.92	5.02	4.56	4.06	3.42	3.65	3.15	3.64	3.18	2.77	3.03	....
August	5.27	4.97	4.52	4.70	5.20	4.30	3.89	3.34	3.69	3.51	3.25	3.25	2.79	3.03	....
September	5.51	4.95	4.53	5.03	5.25	4.33	4.13	3.29	3.64	3.72	3.26	3.31	2.80	3.19	....
October	5.70	4.93	4.50	5.35	5.23	4.34	3.97	3.38	3.56	3.47	3.74	3.24	2.53	3.43	....
November	6.04	4.88	4.79	5.18	5.08	4.97	4.03	3.40	3.63	3.54	4.41	3.09	2.78	3.49	....
December	6.09	4.96	4.92	5.01	5.21	4.18	4.04	3.40	3.80	3.36	4.89	3.13	2.80	3.50	....
Total year	5.40	5.23	4.67	5.14	5.16	4.59	4.01	3.48	3.57	3.57	3.96	3.65	2.93	3.29	....

CINCINNATI, OHIO.

January	4.56	5.81	4.61	5.04	4.86	4.65	3.99	3.32	3.33	3.06	3.11	4.70	2.82	2.67	3.68
February	4.61	5.73	4.63	5.24	4.95	4.40	3.77	3.32	3.33	3.09	3.30	4.31	2.82	2.67	3.68
March	4.80	5.29	4.44	5.13	4.96	4.40	3.50	3.32	3.33	3.08	3.82	3.99	2.82	2.98	3.44
April	4.73	5.10	4.47	4.86	4.90	4.30	3.40	3.32	3.33	3.07	5.95	3.84	2.65	2.92	3.43
May	4.66	4.92	4.41	4.76	4.80	4.20	3.48	3.33	3.33	3.02	5.08	3.46	2.59	2.91	3.40
June	4.59	4.75	4.43	4.66	4.81	4.20	3.55	3.33	3.16	3.07	4.87	3.07	2.62	2.91	3.40
July	4.93	4.71	4.32	4.65	4.75	4.20	3.50	3.31	3.05	3.06	4.32	3.15	2.80	2.91	....
August	5.00	4.70	4.25	4.43	4.93	4.17	3.62	3.34	3.03	3.02	3.81	3.09	2.80	2.89	....
September	5.24	4.68	4.26	4.76	4.98	4.12	3.47	3.33	3.05	3.05	3.83	3.07	2.65	3.06	....
October	5.43	4.66	4.23	5.08	4.96	4.02	3.33	3.25	3.06	3.03	3.84	2.98	2.61	3.32	....
November	5.77	4.61	4.52	4.91	4.81	4.02	3.34	3.31	3.08	3.06	4.18	2.83	2.65	3.32	....
December	5.82	4.69	4.65	4.74	4.94	4.02	3.33	3.33	3.07	3.09	4.82	2.85	2.64	3.45	....
Total year	5.13	4.96	4.40	4.87	4.89	4.18	3.52	3.31	3.18	3.06	4.12	3.46	2.71	3.07	....

To the statement that were it not for the existence of the Standard Oil Company consumers would get oil at a much lower price Mr. Archbold replies that it would evidently tend to increase prices if two-thirds or three-fourths of the active capital and equipment engaged in refining should be withdrawn, and also that the opponents of the Standard are inconsistent in testifying that at existing prices the independents cannot make a fair profit. If it is true, as claimed by Mr. Lee, that the Standard makes $1.50 to $2 on every barrel of oil, while the independents would be satisfied with 10 cents, the independents are not now efficient servants of the public.

In reply to Mr. Lee's statement that if there were 50 concerns engaged in manufacturing petroleum just as wide markets would be obtained throughout the world as at present, while consumers would secure as low prices and all refiners would make a fair profit, Mr. Archbold submitted a list of 66 refineries now existing independent of the Standard Oil Company, the average duration of operation of which has been fourteen years.

Mr. Archbold further expresses the opinion that the Standard Oil Company, notwithstanding the fact that it controls more than 80 per cent. of the refined oil production in this country, is unable permanently to exact excessive prices. He admits that it might temporarily have such power, but declares that if it exercised the power injuriously or arbitrarily the combination would lose business and perhaps provoke heavier competition. He hopes, and on the whole believes, that the Standard Oil Company is able to get prices higher than it could do under severe competition, admitting that there is a certain amount of monopolistic power coming from the aggregation of capital itself, but he adds that this monopolistic power is very slight at present. The lessened cost of doing business on a large scale more than compensates to the consumer, in Mr. Archbold's opinion, for the monopolistic power of getting higher prices. Part of Mr. Archbold's testimony in detail is quoted below:

"Q. Now, the general result, then, is this: By virtue of your greater power you are enabled to secure prices that on the whole could be considered steadily somewhat above competitive rates?—A. Well, I hope so. I think we have better merchandizing facilities, better marketing facilities, better distributing facilities and better talent than a competitor can have.

"Q. I am not asking with reference to your power of making profits, but it is with reference to getting the prices from the consumer.—A. Prices are what make the profit. If we had a better average price, we could get a better profit.

"Q. You think, generally speaking, that you get prices for oil slightly above competitive prices?—

A. Well, I should think so; I could not answer—that is a very general question and very difficult to answer. I could not answer that specifically. I hope that we do.

"Q. Of course, in this investigation we are seeing if we can get some general principles on which legislation might be based, and these questions are to bring out, if we can, the power that so great an organization has in fixing prices. Would you say, then, that in the case of an organization that controls perhaps 80 per cent. of the markets of the country there is a monopolistic element that enters in which enables them to hold prices above the regular rate? Is there a monopolistic power that comes merely from the power of capital itself?—A. Undoubtedly, there is an ability, and when that ability, as I have said, is unwisely used, it is sure to bring its own defeat.

"Q. If that ability goes to get an exorbitant price, of course it will invite competition, but when that ability is kept within modest limits, would you still say that it was in the power of such an organization to get the benefit of the monopolistic power that comes merely from the power of capital itself? —A. Well, I should say that that would be a very restricted power, a very restricted limit. The competitors in this country are very active.

"Q. What?—A. The competitors are very active; they are alert at all points with their small offerings in the hope to find just such a condition as you describe.

"Q. Certainly.—A. But, as I say, as business is and as it has been for many years, we could not have that ability to any considerable extent as merchants.

"Q. If the ability were operative only to a slight extent, would it still be enough, do you think, to make a difference between what we may call a moderate dividend, say 6 or 7 per cent., and a pretty high dividend of between 15 and 20 per cent?—A. Well, that involves so nice a question that I could hardly undertake to answer it; but generally, as to the effect on the communtiy, I should say—

"Q. Generally on the prices in the United States? —A. I should say that the lessened cost incident to doing business in a large volume would more than compensate the consumer for any ability in getting higher prices.

"Q. Then, that leads to this point, whether the large capital does itself give an organization the power to get a somewhat higher price than it could in the market provided the competitors were substantially equal in power?—A. Oh, it may be so; but that is a difficult question to answer."

Mr. Thurber expresses the belief that the reduction in the price of refined oil was from 25.7 cents in 1871 to 5.7 cents in 1898. This is attributable partly to increased production of crude oil, but more largely to improvements in manufacture and transportation attainable only through aggregation of capital.

Mr. Boyle believes that the Standard Oil Company has been beneficial to the producers as a whole and to the public generally. The producers now are prosperous and satisfied with the prices they are obtaining. Without the organization of the Standard Oil Company the business could never have been developed as fully as it has been, through the superior organizing and marketing ability of the combination.

COST AND PROFITS OF REFINING—BY-PRODUCTS.

Closely connected with the subject of prices is the cost of refining and the rate of profit. Opponents of the combination believe that it makes excessive profits on each barrel of oil refined, and confirm this by pointing to the high dividends and the great value of the stock of the Standard Oil Company.

Thus Mr. Lee testifies that with refined oil selling at 9½ cents in New York, as it did in 1896, the Standard Oil Company should have received a profit of nearly 100 per cent. above the cost of refining. The witness believes that the Standard now makes from $1.50 to $2 on every barrel of oil. The difference in price between crude and refined oil during the past 20 years has decreased only slightly, while the cost of refining has fallen from 2½ cents to less than one-half cent a gallon, so that profits have greatly increased.

Mr. Phillips estimates that the Standard Oil Company has made an average profit of $1 per barrel on all oil produced during its existence. He declares that its existing plants have practically been paid for entirely out of its profits. The value of its stock is nearly $500,000,000, and the number of barrels of oil produced during the past 17 years is about $500,000,000, these figures representing to the Standard a profit of about $1 per barrel. The average price of crude oil itself has been only about 90 cents. Mr. Phillips, like Mr. Lee, declares that the independent refiners would be satisfied with a profit of 10 cents per barrel, which is more than they earn now. He admits that the higher profits of the Standard are partly due to superior utilization of by-products.

Detailed estimates as to the cost of refining and the margin of profit were not presented in evidence. Several witnesses pointed out that the by-products of refining, which are of great value, must be considered, and that they complicate the calculation.

Mr. Westgate, an independent refiner, testifies, broadly, that the cost of refining oil is about one-half cent per gallon, but adds that where crude oil is three cents and refined oil is sold at four it does not follow that the clear profit is one-half cent. There is a loss of quantity of from 5 to 7 per cent. in refining, and some by-products of lower grade are sometimes worth as much as refined oil, but sometimes less.

Mr. Monnett states that it has been brought out repeatedly in the Ohio suits and trust investigations that refined oil could be delivered in Ohio at a cost of four cents a gallon or even lower.

Mr. Rice declares that from 1871 to 1880 the cost of refining oil did not exceed one cent per gallon,

from 1880 to 1890 one-half cent, and since 1890 one-fourth cent, although to the average independent refiner the cost has been about one-eighth cent higher than this. He states further that during the past 10 years oil could have been sold in this country, on the average, at 2¾ cents per gallon. He calculates that the market price of crude oil has averaged only 1¾ cents per gallon; that the cost of local pipage to the seaboard has not exceeded one-eighth cent each, while he adds one-fourth cent for the cost of refining, and one-half cent as the average rate of freight paid by the Standard Oil combination to interior places. The Standard makes a still higher profit on oil refined from Ohio crude, which costs very much less per barrel.

Mr. Davis states that the cost of fuel and some of the chemicals used in refining has been considerably less during the past three or four years than before. The independents themselves buy their sulphuric acid chiefly from the Standard Oil Company, which furnishes it chaper than other dealers. Twenty years ago the by-products, benzine, tar, etc., were largely thrown away, but they are now often worth more than the refined oil.

Mr. Archbold testifies that the improved methods of utilizing by-products in recent years have greatly increased their sale, and that they substantially equal in value the refined oil itself. On its being pointed out that notwithstanding the increased profits from this source the margin of price between refined oil and crude oil had not been materially decreased during a number of years, Mr. Archbold states that there is a point below which it is not possible to reduce prices, and that, in his opinion, the profits of the Standard Oil Company have not increased during the past six years. He also states that in calculating the profits of refining illuminating oil is not considered by itself, but the value of all products jointly is taken, the price of each being fixed according to demand.

ECONOMIES OF COMBINATION AND CONSEQUENT ADVANTAGES.

GENERALLY.

Mr. Archbold declares that large corporations are necessary, especially in view of rapidly growing foreign commerce, and maintains that the Standard Oil Company has done very much to develop foreign trade in petroleum. It has also been beneficial to the consumers generally in furnishing them goods of vastly improved quality at greatly reduced prices, and in distributing oil to the most remote sections of the country promptly and cheaply. During the early years of the petroleum industry the methods of production, manufacture and transportation were very crude and the average quality of oil unsatisfactory. The Standard Oil Company brought to the business ample capital, employed the best possible talent in all branches, used the most progressive methods and the most perfectly equipped and favorably located refineries, and inaugurated new systems of transportation. One of the chief advantages of combination is that the best formulas and processes can be employed in every one of the separate establishments.

Mr. John D. Rockefeller, in an affidavit, replying to interrogatories from the commission, states: "I ascribe the success of the Standard to its consistent policy to make the volume of its business large through the merits and cheapness of its products. It has spared no expense in finding, securing and utilizing the best and cheapest methods of manufacture. It has sought for the best superintendents and workmen and paid the best wages. It has not hesitated to sacrifice old machinery and old plants for new and better ones. It has placed its manufactories at the points where they could supply markets at the least expense. It has not only sought markets for its principal products, but for all possible by-products, sparing no expense in introducing them to the public. It has not hesitated to invest millions of dollars in methods for cheapening the gathering and distribution of oils by pipe lines, special cars, tank steamers and tank wagons. It has erected tank stations at every important railroad station to cheapen the storage and delivery of its products. It has spared no expense in forcing its products into the markets of the world among people civilized and uncivilized. It has had faith in American oil, and has brought together millions of money for the purpose of making it what it is, and holding its markets against the competition of Russia and all the many countries which are producers of oil and competitors against American oil."

Mr. Boyle believes that the success of the Standard Oil Company proves that it was the fittest to survive, and that its methods have been most skillful. There was nothing 20 years ago to prevent other organizations from being formed to control pipe lines and to develop the oil business, but they failed to do so. The Standard then invested $3,000,000 in one pipe line, incurring what was considered a very great risk. Its officers had the courage, energy and ability to strike out where others feared to enter. But the pipe line system has been only one factor in the success of the Standard. Its greatest superiority has been in its ability to market its products, in its organizing mercantile capacity. Mr. Boyle does not consider that the Standard Oil Company is especially superior in its methods of manufacturing. Neither the Standard Oil Company nor the independents have the monopoly of inventive genius. The Standard, however, is entitled to more credit than it has received for its achievements in refining Lima oil satisfactorily.

The witness believes that the ability of the Standard Oil Company has had a great influence in making the oil business as extensive and prosperous as it is today. Without this organization the business would be carried on on a much smaller scale.

TRANSPORTATION AND LOCATION OF REFINERIES.

Mr. Dodd, solicitor of the Standard Oil Company, in his statement summarizes the advantages

of the methods of the Standard in regard to transportation as follows:

"1. They have cheapened transportation, both local and to the seaboard, by perfecting and extending the pipe line system; by constructing and supplying cars by which oil is shipped in bulk; by building tanks for storage of oil in bulk; by purchasing and perfecting terminal facilities for receiving, handling and reshipping oils; by purchasing and building steamers and lighters for river and harbor service; by building wharves, docks and warehouses for foreign shipments; by purchasing and building ocean steamers for carrying oil in bulk, and by employing in foreign countries the same special methods for storing and transporting oils in bulk, by which means alone the markets of Europe are today held by American oil against Russian competition."

Mr. Rockefeller and other witnesses emphasize the economy of the pipe line system, and the need of large capital to make it successful.

Mr. Dodd states that some of the refineries which entered the Standard Oil Trust were abandoned because of unsatisfactory location or ill adaptation for the desired work, being replaced by others at more convenient locations and superior plants. In fact, during the past 18 years all the plants of the combination have been practically made over and rendered more effective.

Mr. Page urges with special emphasis that the Standard Oil Company has considerable advantage over its competitors in the cost of transporting oil by rail, owing to the fact that it has many refineries in different places and can supply the consumer from the nearest point, while the owner of a single refinery has to ship much longer distances. The point is made in reply to charges that the Standard secures lower freight rates than its competitors, and is more fully summarized under the heading "Railway Discriminations."

Mr. Lee believes that oil can be refined cheaper in the interior than on the seaboard. Land, labor and fuel are all cheaper and water is abundant.

Mr. Emery testifies that the Standard Oil Company has in recent years been inclined to rebuild refineries in Pennsylvania, and to do a relatively small proportion of its business near New York and elsewhere on the coast. Fuel is cheaper in Pennsylvania and it is in every way the proper place for refining oil. The Standard Oil Company has spent millions in new plants in Philadelphia and also in the oil districts.

PROCESSES.

Mr. Dodd summarizes the advantages of combination in regard to the processes, etc., as follows:

"By uniting the capital, skill and acts, and the various processes and patents of a number of persons, as well as their secret processes, and by building up manufactories on a more extensive and perfect scale, with improved machinery and appliances, and by locating them in the centers of the trade they were intended to reach, the manufacture of oil has been much cheapened and improved.

"By spending large sums in the investigation of methods of utilizing Ohio and Indiana oils, and by purchase of various patents, they have succeeded in making a superior article of illuminating oil out of what for some years seemed an almost worthless product.

"By uniting with the business of transporting and refining businesses necessarily collateral thereto, to-wit, the manufacture of barrels, tin cans, boxes for inclosing cans, paints, glue, sulphuric acid, etc., and by union of capital and skill, obtaining the best machinery and manufacturing on a large scale, they have cheapened these products."

Mr. Dodd enumerates the patents held by the Standard Oil Company in 1882, on machinery and processes. Most of these have to do with the manufacture of cans, boxes and barrels. There is one patent upon stills for refining and distilling oils, one on an apparatus for separating petroleum products, and several upon the manufacture of lubricating and hydrocarbon oils, paraffine and vaseline.

Mr. Lee believes that the Standard Oil Company has no appreciable superior processes or economies in production. There may be some slight difference in favor of large refineries, but one with a capital of $500,000 would be able to secure every by-product at the lowest possible cost. The independents produce oil as cheaply as the Standard, and of better quality. The making of tin cans and barrels can also be done as cheaply by other manufacturers.

Mr. Emery declares that the Standard Oil Company has not improved the methods of refining especially, but that, on the contrary, if the business had been entirely open to competition, there would have been more rapid development than has taken place. As early as 1872 the company with which the witness was connected was employing every device which is now used for making illuminating oil. The process of distillation, in fact, is not difficult, and is practically the same now as in 1860, cylinder stills being used both then and now.

Mr. Westgate does not consider competition against the Standard Oil Company impossible so long as fair conditions prevail. Mere aggregation of capital is not the difficulty. The advantages in the matter of transportation and the cutting of prices below the cost of production are the causes of the Standard's ability to drive out competitors. These evils should be checked by law.

BY-PRODUCTS.

Considerable testimony was adduced as to the superior advantages of the large capital of the combination in manufacturing and marketing the by-products of petroleum. This advantage was generally admitted by the opponents of the Standard.

Mr. Archbold testifies that there has been a decided increase in the value of by-products in the refining of oil during the past 10 or 15 years. The

leading products are gasoline, naphtha, paraffine, lubricating oils, and vaseline products. He does not consider that a refinery with a capitalization of only $500,000 could secure these by-products in anything like as economical a manner as the Standard Oil Company does with its great specialization of methods. The by-products are now substantially equal in value to the illuminating oil itself.

Mr. Emery testifies that fully 200 by-products of petroleum are used for medical purposes, besides the use of aniline dyes. Lubricating oils and paraffine wax are not, strictly speaking, considered by-products. The wax may be taken out of refined oil at a certain distillation, if it is profitable to do so, or it may be broken up by heat and left in the illuminating oil. Until recently the various by-products were not of very great value. The witness has sold paraffine wax as low as 1¼ cents per pound within three years, but it is worth to-day from 3 to 4 cents per pound. Paraffine wax is used largely in making joints of pipes, and in covernig all electrical conductors, as insulators. It is mixed with stearin for making candles.

Mr. Emery acknowledges that the Standard Oil Company has greatly developed the amount, quality and sale of by-products, but declares that other active refineries could have devised the same methods if they had had the opportunity. As a matter of fact, during a long period of time the Standard Oil Company had the exclusive control of the refining business, and naturally was the only one to make improvements. Many of the inventions in this regard have been made in Europe.

Mr. Emery does not know whether the by-products of petroleum may equal in value the refined oil, as stated by the Standard Oil Company. His own refinery uses Bradford crude oil, which is specially rich in lubricants. He makes, for the most past, only the crude stock for refined by-products, such as cosmoline, but sells from $30,000 to $35,000 worth of them monthly.

Mr. Phillips believes that so far as the processes of producing and refining crude oil are concerned, the independents are on a par with the Standard, but the Standard has an advantage in selling, because of its accumulated capital enabling it to handle all the by-products, etc. The superior utilization of the by-products partly accounts for the greater profits of the Standard Oil Company.

Mr. Davis states that a large refinery with facilities for making gasoline and other by-products is much more profitable than one which makes only illuminating and lubricating oil. But it is scarcely a safe investment to attempt to manufacture these by-products. The railways are largely consumers of lubricating oils, and these deal almost exclusively with the Standard Oil Company. Even a large investment would be likely to prove unprofitable. The refinery controlled by the witness had a capacity of about 8,000 barrels per week. A refinery of that size is confined to the manufacture of illuminating and lubricating oil. This refinery sold its by-products, without finishing them, to Scofield, Shurmer & Teagle, and elsewhere, but never secured a profit from them.

PURCHASE OF COAL.

Mr. Lee believes that the Standard Oil Company like other large consumers of coal, is able to secure it at low prices. It practically fixes what it will pay. This has an injurious effect on the wages of coal miners.

Mr. Archbold denies that the Standard obtains special rates on coal and declares that it buys in the open competitive market.

ADVANTAGE OF FOREIGN TRADE.

Mr. Archbold urges especially, as a justification of the methods of the Standard Oil Company, that large aggregation of capital has been absolutely necessary to the successful development of the export trade in petroleum. Any restriction in the amount of capitalization allowable would greatly hamper that company and other large American corporations in competing with foreign corporations The Standard Oil Company has been conspicuously active in reaching out and securing markets over the entire world. If it had not been so energetic, the producers of oil in Russia and elsewhere would have secured a very much larger proportion of the foreign markets than they now possess. The Standard Oil Company constantly meets strong competition, probably on the whole growing competition, from oil produced in othe countries. Mr. Archbold submitted a partial list of corporations and firms engaged in producing and refining petroleum in Russia and various other countries, with their approximate capitalization, showing how extensive is the investment and how vigorous the competition encountered by the Standard Oil Company. The Standard Oil Company has no interest in any of the concerns. In Russia, especially, the business is getting into the control of men of great wealth and ability—such as the Rothschilds, Nobel Brothers, and prominent English capitalists. There is a rapidly developing petroleum industry in Japan, Sumatra, and Java.

The witness submitted the following statements, showing the amount of refined and crude oil, respectively, produced in different countries, with the percentage of the total assigned to each. He maintains that most of the refined oil produced by each country is the product of crude oil obtained in that country.

World's Production of Refined Illuminating Oil, 1897.

[Barrels of 50 gallons.]

Product of—	Barrels	Per cent of Total
United States	25,268,628	64.23
Russia	9,160,700	23.28
France	1,277,761	3.25
Austria-Hungary	1,046,359	2.66
Sumatra	914,000	2.32
Scotland	331,857	.84
Canada	251,843	.64
Java	230,392	.59
Roumania	230,000	.59
India	180,685	.46
Spain	157,684	.40
Mexico	104,287	.27
Cuba	58,413	.15
Brazil	35,306	.09
Germany	34,822	.09
Peru	19,193	.05
Italy	15,136	.04
Japan	13,689	.03
Puerto Rico	8.236	.02
Total	39,338,991	100.00

World's Production of Crude Petroleum, 1897.

[Barrels of 42 gallons.]

Country	Barrels	Per cent of Total
United States	60,496,499	47.96
Russia	57,094,303	45.26
Austria-Hungary	2,087,617	1.66
Sumatra	1,777,560	1.41
Scotland (1896)	1,316,894	1.04
Canada	809,199	.64
Java	726,373	.58
Roumania	570,886	.45
India (1896)	430,203	.34
Japan	283,571	.23
Germany	165,822	.13
France	70,000	.06
Peru	68,452	.05
Argentine	21,000	.02
Italy	18,149	.01
Other countries (estimated)	200,000	.16
Total	126,136,528	100.00
Total production 1896	118,298,631	.....
Increase	7,837,897	6.6

Mr. Archbold also submitted the following statement showing the proportion of the total export trade in petroleum products done by the Standard Oil Company.

VALUE OF EXPORTS.

Total value of petroleum products exported from the United States for the years 1861 to 1871, inclusive, amounted to..... $199,030,333

Value of exports from 1872 to1898, inclusive (i. e., since the organization of the Standard Oil Company)..... 1,246,846,381

Value of exports by the Standard Oil Company 1,126,401,021

Standard Oil Company, 90.34 per cent of total.

Mr. Page states that the Standard owns a number of bulk tank ships, and also some sailing vessels which are used for shipping oil in cases to the far East. The Standard has many agencies throughout the world, mostly under charge of American citizens.

Mr. Page testifies further that the price of Russian crude oil is much lower than that of American oil and that the Russians are competing actively in various markets, but especially in the Asiatic trade. They have tank steamers for transporting oil to India and even to China and Japan.

The witness has heard and believes that the German government recently issued an order requiring the government-owned railroads to burn exclusively Russian oil in preference to American.

Opponents of the combination present little evidence about foreign oil, although they make statements concerning the conditions of export trade generally, the efforts of independent refiners to find foreign markets, and the methods of competition of the Standard Oil Company against these.

Mr. Phillips, however, maintains that the Standard Oil Company was not the pioneer in shipping oil abroad, but that before its existence a large proportion of the foreign countries had already been reached. He believes that a wider distribution of petroleum would have existed if the Standard had never been formed. The Standard Oil Company has no better talent than others engaged in the same business.

On the general subject of export trade Mr. Lee states that ordinary export oil would not be permitted to be sold in some of our States, but is still of quite high quality. The independent oil is superior to that sold by the Standard, which the witness believes, is partly refined from Lima oil. About 40 per cent of all the crude oil manufactured is exported in the shape of refined oil, while lubricating oils and by-products would bring the porportion up to fully 50 per cent. Germany is the largest oil market in the world, both the Standard and independent companies doing extensive business there. Russian oil is not largely used in Germany. The Standard Oil Company controls most of the business in France. The independents do little business in Asia, Africa, or South America.

Mr. Emery submitted an estimate of the amount of American Oil consumed in European countries. Germany consumes about 6,000,000 barrels; Great Britain, 3,000,000; France, 2,000,000; Norway and Sweden, 1,200; Denmark, 600,000. Practically all of this is sold by the Standard Oil Company, the largest exportation of the independents in any one year having been 400,000 barrels, almost entirely sold in Germany.

Mr. Lee believes that the Standard Oil Company is not transporting oil from this country in tin cans as largely as it formerly did, but that it is supplying its Eastern markets largely with Russian oil and making tin cases abroad.

In reply to this, Mr. Archbold submitted a statement showing the number of tin cans manufactured by the Standard Oil Company in this country and elsewhere from 1894 to 1898. These figures show, for the most part, a steady increase in the number manufactured in the United States, and relatively less increase abroad. A total of 223,116 660 5-gallon cans were manufactured in this country and less than 13,000,000 abroad. The company is compelled by freight rates and tariffs to manufacture some tin cans in Mexico and in Italy, but nowhere else.

During the same five years there have been exported from the United States 109,861,221 cases (each case containing two tin cans) of petroleum, all but 7,463,041 by the Standard Oil Company, while the exports from Russia have been only 53,128,120 cases. The witness submitted a detailed statement of exports to different countries by the Standard Oil Company and by other American refiners, to show the enterprise of the Standard Oil Company in securing foreign markets.

QUALITY OF TRUST PRODUCT.

Mr. Lee believes that the oil refined by the Standard Oil Company has deteriorated in quality within 20 years, since the company has used a considerable proportion of Lima oil for refining, which contains arsenic and sulphur.

To this statement Mr. Archbold replies that, as the result of careful work on the part of the Standard Oil Company, it has been possible to secure refined oil from Ohio crude fully equal to that from Pennsylvania crude. The independent refiners of Pennsylvania have done a great injustice to the producers of Ohio by depreciating the quality of their product and attempting to keep it from being considered on the exchanges as a good delivery.

Mr. Emery denies, from his experience as a refiner, having in his employ as good a chemist as can be found, that sulphur can be entirely eliminated from oil containing it. The chemists of Europe who test the quality of oil imported always detect the presence of sulphur, and on that account practically exclude oil refined from Ohio crude. Such oil is confined in its use almost altogether to the United States and Mexico.

Mr. Rice declares that Ohio oil is decidedly inferior, and that, despite modern improvements in refining it, the sulphur and other impurities cannot all be removed. The refined oil from Ohio crude is mixed with that from Pennsylvania crude, but even then it forms a white film on the lamp chimney, gives an offensive smell and is otherwise unsatisfactory. Mr. Rice declares that the profits of the Standard Oil Company on oil refined from Ohio crude are much higher than on other oil, owing to the lower price of the crude.

Mr. Gall says that his Canadian customers seem to consider the American oil which he sells them much better than what the Standard was selling as Pennsylvania oil. He believes that the Standard had been giving them the Ohio product for years, and putting it off as Pennsylvania oil. Mr. Gall sells Ohio oil also, and makes a difference, generally of about a cent or a cent and a half a gallon, between it and Pennsylvania oil.

Mr. Monnett refers, without quoting it in detail, to a pamphlet issued in England declaring that American oil furnished by the Standard Oil Company is inferior to Russian oil, and describing the illegitimate means resorted to by the Standard Oil Company to prevent Russia from entering English markets.

Mr. Archbold declares that this pamphlet referred to is a scurrilous publication issued by one of the yellow journals of London, which has been practically subsidized by Russian producers. A committee of Parliament investigated the quality of American and Russian oil and fully upheld the safety and quality of American oil.

Mr. Emery explains in detail the methods of refining and the various qualities and tests of oil. When the crude oil is distilled the lighter products pass over first—first the volatile gas, next gasoline, benzine, etc. The first illuminating oil to pass over is the lightest in weight and will burn at about 110 degrees (fire test). It will flash at 85 degrees, but will then go out. This grade of oil was formerly legally used in most of the American States, but later laws have raised the fire test, so that most oil used in this country is from 120 to 150 degrees fire test. Only a limited amount of oil of this higher test can be obtained from crude, and in obtaining it the quality of the lighter grades of oil is lowered.

Mr. Emery considers that 110-degree oil is entirely safe for ordinary use. It will not give so bright a light as 150-degree oil, but will last longer in burning.

One hundred and ten-degree oil is the ordinary export oil. The Germans apply a rigid test to secure the maintenance of this standard. Mr. Emery believes that, in view of the lower price of such oil, it is the most economical for use, and that this is the reason why it is admitted freely by Germany.

CRUDE OIL—EFFECT OF COMBINATION.

EARLY HISTORY OF OIL INDUSTRY.

1. Discovery and Progress—Mr. Boyle presented detailed statements concerning the early development of the oil industry. Oil was refined from coal and shale in considerable quantities during the early part of the present century. Rock oil or petroleum was often observed in connection with salt wells and springs in Pennsylvania and Kentucky and elsewhere, and in 1829 a large flow of oil was secured from a salt well in Kentucky. As early as 1853 and 1854 there was an organized effort to produce petroleum from oil springs and surface gravel in Pennsylvania. E. L. Drake was the first to experi-

ment in drilling especially for oil, and he was first successful in August, 1859.

The industry developed very rapidly, but was greatly hampered by the difficulty of transportation—since the oil district was 30 miles from the nearest railway—and by the lack of barrels for transportation. The first flowing wells were struck in 1861, and produced so largely that prices declined from $20 per barrel to practically zero, there being then no way of storing and transporting oil in such quantities. There was a marked improvement in 1862, and during 1863 transportation by boats enabled oil to reach markets more readily and improved prices. In order to float boats the device was used of damming the water in Oil Creek and letting it out in sudden floods. Small pipe lines for conveying oil were introduced about this time, and during 1863 and 1864 railways were constructed into the oil territory. During the latter year many stock companies were formed and speculation was excessive. The price of oil was forced up in July, 1864, to $13.75 per barrel. The cost of transportation was still very great, and during the war a tax on crude and another on refined petroleum was levied by the national government.

In 1865 improvements in drilling, such as the use of casing, torpedoes, etc., were introduced, and pipe lines began to be used more extensively for transporting oil from the wells to railway points. The cost of transportation of oil from Pithole to New York in December, 1865, was $5.55 by one route and $4.59 by another.

During 1866 and 1867 production increased rapidly and prices fell greatly. There were a number of bank failures. Mr. John Ponton, in a pamphlet entitled "The Crisis in the Oil Region," estimated that a profit of $504 could be secured during the first year of production of the average oil well, costing $3,500, by the use of gas as fuel for pumping; but if coal should be necessary for pumping there would be a loss of $1,507. He advocated a restriction of output. But meantime improvements in transportation were being made, which soon brought renewed prosperity to the oil producers.

In 1869 the Petroleum Producers Association of Pennsylvania was organized especially for the purpose of securing statistics of production, and thus protecting the producers from the depression of prices by speculators. A circular stating the objects of this association was submitted by the witness. Prices were higher than during any of the three previous years. There was, however, a decline during 1870. About 1871 the first discoveries of oil in the Bradford field were made, but the field was not developed until considerably later. During 1872 the Butler and Clarion fields were rapidly developed, so that there was soon an overproduction of oil.

Mr. Emery also makes a brief statement of the early history of the oil business, dwelling especially on the history of pipe lines.

2. Oil Exchanged and Speculation—In the early days of the oil business the prices received by producers were determined in part by the so-called dump men, owners of "dumps" or tanks, who gathered up, and sold again, the oil of the small producers. The dump man developed into a refiner later on; and as a refiner he especially made a business of handling oil from the bottoms of tanks, not salable on the general market. The agents of larger refineries went from place to place, buying oil directly from producers and often following the prices of the dump men. Later on these agents became more systematic in their methods and finally met regularly at special places to deal with producers. Thus originated oil exchanges, which at first were more in the form of chambers of commerce, but later took on more distinctly the form of exchanges. The oil exchanges at Titusville, Oil City and Franklin were organized formally about 1871. These became numerous and speculation upon them rapidly increased, both among producers themselves and among outside persons. The producers who refrained from speculation invariably got wealthy, while those who speculated became poor.

STATISTICS OF PRODUCTION AND PRICES.

Crude oil is produced in a number of different States of this country and in numerous foreign countries, especially Russia. The quality known as Pennsylvania oil, which is also found largely in New York, West Virginia and a part of Ohio, is considered much superior to Ohio or Lima oil and that found in California and other States, as well as to Canadian and Russian oil.

The following statement was submitted by Mr. Archbold:

Crude Oil Production, by States, Years 1896, 1897.

[Barrels of 42 gallons.]

States	1896	1897	Increase or decrease	Increase or decrease	Average value per barrel	
					1896	1897
				Per Cent.		
Pennsylvania	19,795,779	18,439,180	1,356,599	6.9	$1.186	$0.795
New York	736,606	771,606	35,000	4.8	1.179	.786
West Virginia	10,005,966	13,078,011	3,072,045	30.7	1.180	.788
Ohio (Pennsylvania oil)	3,365,365	2,877,193	488,193	14.5	1.180	.788
Ohio (Lima oil)	20,575,139	18,682,677	1,892,462	9.2	.739	.520
Indiana	4,646,952	4,110,356	536,596	11.5	.630	.456
Kentucky	1,680	322	1,358	80.8	.550	.500
Tennessee	4,325	4,325	25	1.2	.....	.....
Missouri	43	19	24	55.8	4.30	9.16
Colorado	361,450	477,499	116,049	32.1	.883	.810
California	1,252,777	1,903,411	650,634	51.9	.990	.900
Kansas	113,571	81,098	32,473	28.6	.450	.400
Wyoming	2,878	3,650	772	30.3	8.00	8.00
Illinois	250	500	250	100	5.00	4.00
Texas	1,450	65,975	64,525	.....	.720	.570
Indian Territory	170	625	455	.....	4.000	3.30
Total	60,864,401	60,496,499	367,902	0.6	.960	.676

Total value of production, 1896	$58,518,709
Total value of production, 1897	40,929,611
Decrease	$17,589,098

1. Pennsylvania Oil—Mr. Boyle and Mr. Archbold submitted the following table showing the average daily production of Pennsylvania crude oil from 1870 to 1898, the average price of crude oil per barrel of 42 gallons and of refined per gallon, and the variations in stocks on hand. It should be noted that the price of refined oil includes the value of the barrel, worth about 2½ cents per gallon:

Production and Prices of Pennsylvania Oil.

Year	Average daily production	Average price per barrel	Refined per gallon	Stocks increased	Stocks decreased	Total stocks
	Barrels.			*Barrels.*	*Barrels.*	
1870	15,350	$3.90	$.026⅝	203,872	.....	544,626
1871	15,800	4.40	.24¼	.....	12,626	532,000
1872	17,925	3.75	.23⅝	552,223	.....	1,084,423
1873	27,106	1.80	.18¼	541,134	.....	1,625,157
1874	29,937	1.15	.13	2,080,462	.....	3,705,639
1875	24,075	1.24¾	.13	.....	155,439	3,550,200
1876	24,505	2.57⅝	.19⅛	.....	725,461	2,824,739
1877	35,988	2.39⅜	.15¾	303,098	.....	3,127,837
1878	41,544	1.17⅛	.10¾	1,487,463	.....	4,615,300
1879	54,206	.85⅝	.08⅛	3,936,956	.....	8,552,256
1880	71,114	.94⅛	.09⅛	8,592,848	.....	17,145,104
1881	75,004	.85¼	.08	8,615,947	.....	25,761,051
1882	82,338	.78½	.07⅜	8,574,093	.....	34,335,144
1883	63,365	1.05⅞	.08⅛	1,380,421	.....	35,715,565
1884	65,129	.83⅝	.08¼	1,157,327	.....	36,872,892
1885	56,921	.88⅜	.08⅛	.....	3,333,854	33,539,038
1886	70,679	.71⅜	.07⅛	.....	171,140	33,367,898
1887	58,846	.66⅝	.06¾	.....	5,011,786	28,357,112
1888	45,058	.87	.07½	.....	9,752,638	18,604,474
1889	58,869	.94⅛	.07⅛	.....	7,699,681	10,904,793
1890	82,376	.86⅝	.07⅜	.....	1,609,279	9,295,514
1891	98,191	.66⅞	.06⅞	6,047,719	.....	15,343,233
1892	91,328	.55½	.0607	2,052,155	.....	17,395,389
1893	85,296	.54	.0524	.....	5,284,206	12,111,183
1894	84,334	.83¾	.0519	.....	5,774,406	6,336,777
1895	84,820	1.35¼	.0736	.....	1,174,872	5,161,905
1896	92,815	1.19	.0698	4,488,678	.....	9,550,583
1897	96,357	.78⅜	.0591	1,239,069	.....	10,789,652
1898	85,206	.91⅛	.0631	752,101	.....	11,541,753

Since 1870 the daily production has increased 450 per cent.; the price of crude oil has declined 75 per cent., and the price of refined about 75½ per cent.

Mr. Lee gives figures showing the highest and lowest prices of crude oil for each year since 1869 to 1897, and explains some of the chief fluctuations. The South Improvement Company was formed in 1872 and largely controlled transportation, by this means depressing prices of crude oil. New discoveries of oil in Butler county further decreased prices, but in 1876 and 1877 the working out of this field and increased speculation again raised prices largely. The rise in 1883 was due to the practical giving out of the Cherry Grove field, opened in the previous year, and to the decline in the Bradford field. The increase from 1888 to 1890 was due to restriction of production by agreement. The heavy production of the McDonald field then greatly reduced prices, while the increase in 1895 and 1896 was made arbitrarily by the Standard Oil Company.

Mr. Davis states that the Macksburg oil field, about 25 miles from Marietta, produces a high quality of oil, containing much paraffine, and known as "white sand oil." More recently the Corning field has been discovered 40 miles northwest of Marietta. The oil is in many ways as valuable as the white sand oil, but the price is fixed by the Standard Oil Company, through its pipe line, at 17 cents per barrel less. The production of oil in these two fields is about 10,000 barrels per day, while in the Lima field it is about 60,000 barrels per day.

2. Canadian Oil—The production of crude petroleum in Canada is confined almost altogether to western Ontario. The total production is about 750,000 or 800,000 barrels per year. Practically all of this is refined and used in Canada, and in addition about 38 per cent. of the entire amount of refined products used is imported from the United States. Most of the crude production is in the hands of small owners, but the Standard Oil Company controls about 25 per cent.

Mr. Gall testifies that Canadian oil is much inferior to Pennsylvania oil, and even to Ohio oil. The difference in price made by his company between Pennsylvania and Ohio oil is usually about 1½ cents. The witness believes that the Standard Oil Company has been selling Ohio oil in Canada under the name of Pennsylvania oil.

3. Russian oil is not as productive of illuminants as American oil, and the refined oil is inferior in quality, containing some sulphur. The basis of American oil is paraffine, and from 75 to 78 per cent. of illuminating oil can be obtained from Pennsylvania crude. The basis of Russian oil is asphalt, and it gives only about 25 per cent. of refined oil. California oil also has an asphalt base.

METHODS OF LEASING LANDS.

In many instances oil producers buy lands, but the more common custom is to lease them for oil purposes, giving the owner one-eighth. The lease usually runs for 20 years.

Mr. Monnett mentions one-sixth as the average amount that goes to the land-owner in Ohio.

The proportion of the value of oil going to the land-owners as royalty had varied from one-half to one-eighth, the latter proportion now prevailing in most parts of the oil fields.

COST OF DRILLING WELLS.

Mr. Emery, who has drilled several thousand oil wells, testifies that in the lower oil regions, where wells are sometimes as deep as 2,000 feet, the cost is often $8,000 or $10,000. In the upper region the cost was formerly about $2,500, the average, perhaps, for both regions being about $4,000. But it would be impossible to drill wells at these figures today, since the price of iron, which is largely used in casing, has doubled.

Mr. Davis states that the cost of producing oil had decreased materially until 1899, when the increase in the price of iron for casing, tubing and machinery increased the cost of sinking wells. The cost of production varies greatly in different fields according to the depth, the kind of casing which must be used and the amount of production. The cost of drilling may be $5,000 or $6,000. Expert drillers are paid $4 or $5 per day.

Most labor in the drilling of oil wells is done by contract, so that it is difficult to estimate the average rate of wages or the average length of time the men are employed. The wages differ considerably according to the skill of the worker; a first-class man is likely to earn as much as $1,000 in a year. The labor, both in drilling and in refining oil, is well cared for, and is loyal to the producers and to the Standard Oil Company.

PROPORTION OF CRUDE PETROLEUM CONTROLLED BY STANDARD.

Mr. Lockwood testifies that the Standard Oil Company owns a large percentage of the Ohio fields and has been acquiring much production in the Pennsylvania and Virginia fields. Its policy has been to depress the price of crude oil, so that lands could be purchased at low figures. Thus the price of Lima oil was kept down to between 10 and 20 cents, after the Standard Oil Company had introduced its pipe lines and had influenced the railways to fix high rates for transportation, so that it practically fixed the price of oil. The purchases in the Pennsylvania and Virginia fields also were made just before the great rise of prices in 1896 and 1897. By increasing prices after these purchases of land the public was made to pay for the investment. Moreover, stocks had been reduced to between 4,000,000 and 5,000,000 barrels, and the law of supply and demand, as well as the desire of the Standard Oil Company to make profits, forced an increase of price.

Mr. Phillips confirms the general features of this testimony.

Mr. Lee states that the Standard Oil Company controls from 23 to 25 per cent. of the production of crude oil. More than half of the entire produc-

tion is owned by men who produce less than 10 barrels a day each. The owners of from 40 to 50 per cent. hold stock in the independent pipe line and marketing companies. The effect of the production of crude by the Standard Oil Company has been to reduce prices. It is able, by its large capital, to drill deep wells and secure high production. It has also leased large blocks of oil lands in West Virginia and has held them for future development.

Regarding the Ohio field, Mr. Davis testifies that when territory is found to produce oil in profitable quantities, various companies, such as the South Penn Oil Company, the Ohio Oil Company, the Carter Oil Company, etc., which are believed to be creatures of the Standard Oil Company, buy up the ground largely. They have plenty of capital and pay fair, even exorbitant prices, overbidding their competitors.

In reply to the charges of Mr. Lockwood that the Standard Oil Company had used its control of prices of crude oil to depress the value of oil lands and secure practically the entire control of crude production in Ohio, Mr. Archbold submitted the following statement, showing the amount and proportion of the total crude output, both in Pennsylvania and Ohio, produced by the Standard Oil Company. It is to be noticed that while the proportion of Pennsylvania oil produced by that company has rapidly increased, the proportion of Lima oil controlled by it for some time decreased rapidly and later increased only slowly. (While Mr. Lockwood's statement referred to ownership of land and Mr. Archbold's to production of oil, some degree of correspondence between land ownership and oil production would naturally be expected.)

Production of Pennsylvania and Lima Crude Oil by Standard Oil Company and Others, Years 1890 to 1898, inclusive.

[Expressed in barrels of 42 gallons.]

Year	Pennsylvania Oil.			Lima Oil.			Grand Total.		
	Total production	Standard Oil Co. production	Standard Oil, per cent of total	Total production	Standard Oil Co. production	Standard Oil, per cent of total	Pennsylvania and Lima production	Standard Oil Co. production	Standard Oil, per cent of total
1890	30,065,867	2,618,637	8.71	15,014,882	8,400,568	55.95	45,080,749	11,019,205	24.44
1891	35,742,127	4,913,775	13.74	17,381,923	9,319,156	53.61	53,124,050	14,232,931	26.79
1892	33,332,306	4,338,822	13.02	16,685,193	7,843,324	47.01	50,017,499	12,182,146	24.36
1893	31,256,283	6,705,276	21.45	17,823,255	7,260,899	40.74	49,079,538	13,966,175	28.46
1894	30,696,716	7,210,345	23.49	18,575,603	6,690,951	36.02	49,272,319	13,901,296	28.21
1895	30,891,868	9,119,820	29.52	21,719,250	6,808,876	31.35	52,611,118	15,928,796	30.28
1896	33,908,041	9,380,654	27.66	25,222,091	8,031,793	31.84	59,130,132	17,412,447	29.45
1897	35,170,367	9,787,353	27.83	22,793,033	7,497,349	32.89	57,963,400	17,284,702	29.82
1898	31,645,151	11,248,443	35.55	20,266,328	7,220,606	35.63	51,911,479	18,469,049	35.58
Total	292,708,726	65,323,225	23.32	175,481,558	69,073,522	39.36	468,190,284	134,396,747	28.70

EFFECT OF STANDARD OIL COMBINATION ON PRICES.

1. Opponents of Combinations—Several witnesses testify that the practical monopoly of the Standard Oil Company in the purchase of crude oil has been employed by it to depress prices, greatly to the injury of producers. The Standard Oil Company has control of far the greater proportion of the pipe lines in the oil regions, and producers have no choice but to sell to these pipe lines at the prices fixed by them. The evidence to the effect that this power of depressing prices has been used in order to buy up oil lands at low figures has been already referred to. It is especially claimed by witnesses that the practice of the Standard Oil Company since 1895 of disregarding the prices of oil made on the exchanges has given it still greater control over the market.

Mr. Lee's testimony is especially full on this point. He states that there has been a great fall in the price of crude oil since 1870, when it was $4.90 per barrel ,the price in 1897 ranging from 65 to 96 cents. This decrease, while partly due to new discoveries of oil, cheaper drilling of wells and improved methods, is largely owing to the combination of refiners. For 10 years previous to 1895 the average price of crude oil was kept below 80 cents, which is to most producers unprofitable. This low price was not mainly due to overproduction. Thus, when the Bradford oil field was opened in 1881 production increased greatly, so that 39,000,000 barrels were in stock in 1884, yet the price was reduced only to $1.12 or $1.15, as compared with $1.24 in 1880. In 1887 the stock had fallen to 31,000,000 barrels, and the production was about the same as in 1884, but the price had fallen to 66 cents. The arbitrary limitation of production from 1887 to 1889 increased prices somewhat, but less than was anticipated. Since January, 1895, the Standard Oil Company has ceased paying the market prices for oil, as fixed on the exchange, and has simply announced the prices it would pay daily. The range of prices, however, has been higher since 1895, averaging $1.05. This has not been chiefly due to increased competition of independent pipe lines, although they pay often from one to nine cents per barrel more than the Standard Oil Company, and undoubtedly tend to keep up prices. The sudden increase in

price to $2.60 in 1895 was entirely arbitrary, apparently intended to injure independent refineries.

Crude oil producers as a body have been losing steadily, but they continue to drill and to pump oil, largely because of the speculative possibility of striking large wells and the hope of better conditions in the future. The witness believes that the cost of producing a barrel of crude oil now averages from $1 to $1.20. Mr. Lee declares that he believes, in fact, that the oil-producing counties would have been better off if they had never produced a barrel of oil. The price of logal pipage has not been reduced by the Standard Oil Company since 1870.

The producer who happens to strike a well with a large flow could of course sell much below the producer whose well yields a small quantity, since the cost of drilling in each case is about the same. But the greater part of the production is from small wells and the price must be sufficient to enable them to be drilled, aside from the matter of the speculative drilling of wells in hope of large production. The result is that the owner of a large well secures a very high profit from a normal price.

Mr. Monnett states that the laws of various States and other obstacles make it almost impossible for independent pipe lines to be laid. The Cudahys of Chicago have been trying for years to secure pipe line privileges in Indiana and Ohio. The companies belonging to the Standard charge prices so high as to prevent independent refiners or producers from shipping. Producers in Ohio are practically compelled to sell to the pipe line companies at the price they may fix, having no other means of outlet. The pipage rate in Ohio everywhere is 20 cents per barrel. The Buckeye Pipe Line Company has had a gross income in three years of $19,495,495 from Ohio business, while the land-owners have received for the leases of their land only $9,747,000.

In the Ohio field, to judge from Mr. Monnett's testimony, the Standard Oil Company itself produces much of the oil by lease from the owners of the land, paying them 60 cents per barrel for one-sixth of the oil. In any case it practically fixes the price of crude oil by its control of the pipe lines. The witness gives a rough estimate that the Standard makes gross sales of about $120,000,000 and a profit of about $50,000,000 annually from Ohio oil. The witness does not know precisely what proportion of the crude product is controlled by the Standard Oil Company, but thinks it is much more than one-half. By its control of transportation the Standard causes the producer to accept less than the true value of his oil.

2. Reply of Standard Oil Company—As evidence that producers have received fair prices and profits, Mr. Boyle submitted a table of figures showing the annual production of crude oil by barrels since 1860, the average price and the total value. Combining these figures for 10-year periods, we find that from 1860 to 1869 the 27,944,500 barrels produced were valued at $111,142,603; from 1870 to 1879, 108,535,306 barrels were valued at $207,892,617; from 1880 to 1889, 241,544,250 barrels were valued at $206,623,341, while from 1890 to 1898, 293,220,986 barrels were valued at $253,113,285. Mr. Boyle also submitted the following table showing the number of wells drilled and the estimated cost of drilling for decade periods as compared with the value of crude oil produced:

Years	Wells drilled	Cost per well	Total cost	Value of crude oil
1860-1870 ..	5,000	$4,000	$20,000,000	$111,142,603 00
1870-1880 ..	20,259	3,000	60,877,000	207,892,617 47
1880-1890 ..	32,132	2,000	64,264,000	206,623,341 56
1890-1899 ..	43,490	2,000	86,980,000	253,113,285 00
Total....	100,881	.....	$232,121,000	$778,771,847 03

If we suppose that one-fourth of the value of crude oil produced has gone to the owners of the lands, the balance remaining to the producers, after deducting the cost of wells and the amount paid to land owners, for the entire period of 39 years, would be $351,957,885. The average cost of lifting oil may be estimated at 25 cents per barrel, which would amount to $87,989,471, leaving for the profits of the producing business $263,968,413, or an average per year of $6,768,420.

In the figures for the cost of wells are included 15,000 dry wells, the statistics for producing and dry wells being carefully compiled by newspapers in the oil district since 1875. The witness does not consider that the amount of bonus or rental paid by producers to owners of oil lands before opening production should be considered as an element in the cost of production. It is essentially a speculative venture, in which the producer takes his chances of great profit or of loss.

Mr. Archbold replies, especially to the statements of Mr. Lee as to the unprofitableness of crude oil production, that the population of tens and even hundreds of thousands which now occupies the oil regions, once a comparative wilderness, and the cities, towns and railroads, are sufficient evidence that the industry has been beneficial. He also submitted a table, nearly identical with the one submitted by Mr. Boyle, showing the yearly production and total valuation of crude oil since 1859. Deducting from this total valuation one-eighth to represent the royalty going to owners of the land (this royalty being at the rate of one-eighth now prevailing, although as much as half of the oil has sometimes gone to land-owners), Mr. Archbold arrives at the conclusion that the producers themselves have received a total of $673,704,847 during the past 40 years.

In further evidence on this point Mr. Archbold submitted a list of about 800 prominent oil producers who are, he declares, prosperous and well to do.

On this point Mr. Phillips testifies that a great many of the oil producers are quite well to do, although very few are considered millionaires; but the majority are comparatively poor. They would

have been much better off but for the depression of prices by the Standard.

Mr. Archbold declares that the estimates made by Mr. Monnett as to the amount of gross receipts and profits of the Standard Oil Company from Ohio oil are altogether too unintelligible and ridiculous. He does not consider it worth while to go into a detailed reply. He seems, however, to understand that Mr. Monnett's estimate referred to sales of refined oil products in Ohio. It did refer, in fact, to the total sales of products made from Ohio crude.

3. Overproduction and Prices—So far as there has been a depression of prices below remunerative rates, it is explained by Mr. Boyle as due to overproduction. He points out that there has been a constant tendency toward such overproduction of crude oil. Thus for nearly ten years, during the eighties, stocks of approximately 40,000,000 barrels of oil were being carried by the producers in tanks owned by the National Transit Company. This large surplus on hand greatly decreased prices. Attempts to restrict production have usually failed, especially because of new producers coming into the field.

The witness is inclined to believe that depression in prices of crude oil to some extent injuries refiners as well as producers. A medium price is more advantageous for refiners than either a high or a low one. Nevertheless the witness does not think that the Standard Oil Company has made less profits during times of low prices for the crude product. The value of the Standard's stock has not fallen. The maintenance of its profits has been due in part, apparently, to the reduction in the cost of refining oil during the period of low prices for crude oil. Notwithstanding the excessive production, especially during the eighties, Mr. Boyle believes that the producers of crude oil as a class have made enormous profits. The cost of production has greatly decreased in many cases.

To the suggestion that producers might gain by refining their own oil and saving the profits that come to separate refiners, Mr. Boyle replied that such attempts had frequently been made, but had always failed. The producers are likely to lack the experience and skill in manufacturing and in disposing of goods which are necessary. Mr. Boyle also admits that during the earlier periods of the oil business such smaller refineries controlled by producers were handicapped by railroad discriminations in favor of large refiners.

METHOD OF FIXING PRICES.

The Seep Purchasing Agency, of Oil City, on behalf of the Standard Oil Company, posted on January 23, 1895, a notice quoted by Mr. Boyle, that thereafter the prices paid by it to the oil producers would be "as high as the markets of the world will justify, but will not necessarily be the price bid on the exchange for certificate oil"—that is to say, the Standard Oil Company thereafter fixed prices itself in view of the condition of production and demand throughout the world.

This change was renderd necessary, as stated in the notice and as believed by Mr. Boyle, by the fact that very little oil was actually being sold on the exchanges, so that it was unfair for the prices fixed by such sales to apply to the great quantity of oil handled by the Standard Oil Company. Moreover, speculators on the exchanges had been able to manipulate prices in ways not justified by market conditions. Producers themselves sometimes sold oil to themselves at higher prices in order to fix the price for the Standard Oil Company.

Speculators also resorted, especially during the early eighties, to the practice of circulating false rumors concerning the production and discovery of wells for the purpose of ilegitimately influencing prices. Out of this evil grew up the practice among the larger speculators of employing "scouts" to watch the development in different fields and give information as to the production. The large stocks which were on hand during this period enabled bear speculators to sell short in large quantities without ever covering their sales, and the effect was to depress prices to producers.

Mr. Boyle admits, practically, that the producer has little part in making the price of oil under the new system, although he has the option to refuse the price offered. The claim of the Standard Oil Company is that the markets of the world determine the price.

The effect of the practice of fixing things in this way has been to make fluctuations less marked and to keep the margin between the crude and refind oil more uniform. Mr. Boyle supposes that as soon as crude oil advances refined oil is also advanced in about the same proportion, in most cases. The witness submitted detailed tables showing the average price of crude and refined oil by months for the four years preceding the adoption of this new policy and corresponding prices for numerous dates during the four years after the policy was introduced, the latter figures showing apparently all the changes that have been made in the price of crude oil by the purchasing agency. He calls attention to the fact that the price of refined oil includes the value of the barrel, which amounts to about 2½ cents per gallon, while the value of crude oil is in bulk.

The amount of oil bought by the Seep Purchasing Agency, which is believed to be a representative of the Standard Oil Company, is probably about 80 per cent of the crude oil produced, both in Pennsylvania and Ohio. Mr. Boyle believes that this method of fixing prices by the Standard Oil Company is beneficial to the producers and the consumers also. The amount of speculation in oil has been very greatly decreased, and speculation tended to depress the price to producers, especially when it took the form of gambling on margins. The real effect of the present system is that the consumer makes prices.

On being questioned further concerning the methods of fixing the prices of crude oil, Mr. Boyle stated that he believed that the price of crude followed closely the price of refined, and that the price of the latter was fixed by the demand for oil in Europe. There is undoubtedly some person connected with the Standard Oil Company whose business it is to watch the foreign markets and to decide whether the company shall sell oil at the figures offered by consumers abroad. The various local markets throughout the country have

little influence in determining the price of crude. The changes in the price of crude are usually a full cent at a time, occasionally 2 cents, or even more.

Mr. Archbold testifies that the Standard Oil Company purchases about 80 per cent of Pennsylvania crude oil through its general purchasing agent, Mr. Joseph Seep, of Oil City, and his forty or fifty subagents. The attempt is to fix prices in accordance with the world's markets.

"We have before us daily the best information obtainable from all the world's markets as to what the offerings are and as to what is possible to sell for, and we make from that the very best possible consensus of prices, and that is our basis for arriving at the current price."

Q. "Generally speaking, are the relative prices of the crude oil and the refined oil kept substantially uniform?" A. "Oh, substantially so. Of course it is not always the same. Of course it seems possible sometimes to get a higher price, and we are glad to avail ourselves of the opportunity, and sometimes we have to take a closer margin and still buy the crude, and there, of course, we suffer a loss."

Mr. Davis testifies that when a producer has oil to sell he goes to the agent of the pipe line company, who ascertains by telegraph the amount of oil to the credit of the producer and the price offered. The price is fixed altogether by the Standard Oil Company, though occasionally brokers make bids at higher rates for a few days. A producer can sell his oil to any agent wherever he may happen to be.

RESTRICTION OF PRODUCTION.

Somewhat in confirmation of Mr. Boyle's statement concerning the effect of overproduction in depressing the prices of crude oil is the fact that various attempts have been made by the producers to restrict the output of oil with the avowed purpose of thereby raising prices. The most effective of these restrictions was that of 1887.

1. Early restrictions.—Mr. Boyle describes in detail the earlier movements for restricting production. The Petroleum Producers' Association of Pennsylvania was organized in 1869. A circular issued in 1870 by this association states that its object is primarily to gather correct information concerning the production of oil, stocks on hand and prospects, in order to protect producers against misrepresentation and depression of prices by purchasers. About this time it became evident that stocks were continually increasing, and a movement was inaugurated under the name of the Petroleum Producers' Agency to store all oil above a certain amount and keep it from the market. A circular of this agency was submitted by the witness in which its purpose was stated to be to prevent unwise competition between producers and sellers, and to secure a fair price for whatever amount of oil the world requires, unaffected by the fact that there is more produced than consumption demands. Calculations were made to show that an increase of daily production depressed prices in much more than equal proportion. The agency proposed to buy oil at $5 per barrel so long as the general market would warrant it and to take all remaining oil for storage at the expense of the producers.

This plan failed to go into operation because of the enormous production in Butler county.

The first effective shut-down in production and drilling for crude oil was brought about in 1872. For thirty days there was an almost entire cessation of output in all the fields. The increased prices thus secured tended to encourage drilling immediately after the restriction was dropped, but the chief cause of the rapid decline in prices during 1873 and 1874 was the discovery of new wells and the deepening of the old wells to the "fourth sand." In 1874 there was a local shut-in movement in Clarion county. In 1876 the plan was again started of pooling the surplus oil as a means for advancing the market, but other conditions soon raised prices so that it was unnecessary. Large new production during 1878 led to the formation of the Producers' Protective Association, which lasted for two years. This organization soon became aggressive, and brought suits against pipe line companies and the Standard Oil Company. It had, however, little beneficial effect, production being practically not limited at all and prices steadily falling.

2. Restriction of 1887—Mr. Boyle further testifies that in 1884 there was again an attempt to establish a general combination of producers to restrict drilling. Through the refusal of the operators who were securing large wells in the new Thorn Creek district, the movement was only partially successful, but it led to the organization of the Producers' Associated Oil Company, with a capital stock enabling it, when necessary, to purchase oil property in order to curtail production.

This new organization made an agreement with the Standard Oil Company in 1887 for reducing production. The conditions at that time were worse than ever before. Great stocks of oil had been accumulated through the heavy production of the Bradford field. The stock in 1887 was 31,000,000 barrels. Prices were below a remunerative point, while the Standard Oil Company was losing by the deterioration of the oil in store. This movement to restrict production was the most thoroughly organized which had ever been attempted, and its success was renderd certain by the fact that all the different branches of the oil industry were alike interested, and were co-operating. Although there were 14,000 producers of crude oil, fully 85 per cent of them were brought into the agreement. The movement developed gradually from June to October, 1887, being furthered by various secret and public meetings of the Producers' Protective Association. Conferences were held with the Standard Oil Company and an agreement was finally made to be restricted for one year by one-third, beginning November 1, 1887. This contract was carried out with fair success.

In consideration of the advantage to itself the Standard Oil Company turned over to the producers 6,000,000 barrels of oil at the market price at the time of the contract, 62 cents per barrel, the producers thus securing the profit from the anticipated rise in price. Mr. Boyle states that when the oil was actually turned over the price already stood at 71 cents.

In 1888 further agreements were entered into among themselves by the producers in the association, especially with a view to equalizing the amount of oil which could be produced by each individual. These agreements were called respectively the boundary line drilling contract and the interior drilling contract. The most important provisions follow:

"Hereafter the number and location of wells for the production of petroleum along or adjacent to the exterior boundary line of any producer on either side of said line shall be determined by the agreement of the producers interested in the production along said boundary line, or, in case of their failure to agree, by three arbitrators, one to be chosen by the producer or producers on one side of said boundary line, one to be chosen by the producer or producers on the other side of the said boundary line, and the third arbitrator to be chosen by the two so chosen by the producers aforesaid.

"But no decision of such arbitrators shall be permitted to deny altogether the right of a producer to drill when he can not drill at all without drilling within 800 feet of the boundary.

"No well shall be drilled on or within 800 feet of any boundary line until its location shall have been fixed by agreement of adjoining producers or by award of arbitrators, as hereinbefore provided. * * *

"We, the undersigned, producers of petroleum, do hereby agree to and with each other that we will not drill any wells for the production of petroleum on any form or tract of land owned by us, except along or adjacent to exterior boundary lines of our respective properties, to a greater extent, exclusive of boundary line wells, than one producing well for each twenty acres and each fractional part of twenty acres, provided that additional wells may be drilled with the consent of the local assembly of the Producers' Protective Association for the district in which the particular property may be situated and of the general executive board of said producers' association, or, in case such consent can not be obtained, upon the allowance of the arbitrators, or a majority of them, one to be chosen by the person or persons desiring to drill, one to be chosen by the local assembly of the Producers' Protective Association for the district in which such property is situated, and the third by the two so chosen."

It was not thought possible to bring all the producers into the contract. The owners of large wells in the new Washington field made a great profit by keeping up production at the higher prices. Nevertheless, the effect of the movement was admitted by Mr. Boyle to have been a "hypnotizing" of competition. The price of crude oil was advanced about 25 cents per barrel by the restriction, so that the producers benefited materially.

The price of refined oil to consumers was advanced about three-fourths of a cent per gallon, a difference somewhat less than the advance in crude oil. The loss thus occasioned was partly borne by the Standard Oil Company as the chief refiner of oil, but the company gained by the added prosperity of the producers and the added harmony between them and itself.

Mr. Lee testifies, in less detail, confirming a number of the essential facts stated by Mr. Boyle concerning the restriction of 1887. He adds that as a result of this restriction the production was decreased by 17,500 barrels per day, and by 1889 the stock on hand was reduced to 9,000,000 barrels. The price was raised somewhat by this movement, but not to the extent anticipated, and the arrangement was thereafter abandoned.

Mr. Archbold testifies that the shutdown movement of 1887 was entered into by the Standard Oil Company only at the urgent request of the producers, and was not in any sense initiated by the company. This statement was supported by Mr. Phillips.

3. Effect on Labor—According to Mr. Boyle, the effect of the agreement of 1887 to practically cease the drilling of new wells was naturally to injure the laborers in that occupation. For their relief 1,000,000 barrels of oil were set aside from the 6,000,000 purchased by the producers from the Standard Oil Company, while the Standard added another 1,000,000 barrels for the same purpose, the profits from the rise in price of this oil being paid to the drillers. Meantime the drillers had formed a strong organization and adopted a scale of prices.

The purpose of thus setting aside 2,000,000 barrels of oil for the drillers was rather a business than a philanthropic one. The object was to prevent the oil well workers from engaging in other fields or working for producers outside of the shut-in agreement. It had been the custom during previous shutdowns also to take care of labor. The drillers did not suffer especially during the shutdown, since drilling for gas was active, and the restriction did not refer to Ohio and Indiana oil.

EFFECT OF COMBINATION ON LABOR.

Mr. Archbold testifies that the Standard Oil Company has never had any serious difficulty with its employes in any department; that the entire 35,000 are well paid, contented, and zealous for the company. Mr. Archbold believes in combination of labor just as in combination of capital. Labor and capital are moving on irresistibly toward more thorough organization in themselves and closer and more harmonious relations between one another.

Mr. Lee, an opponent of the combination, admits that the Standard Oil Company has paid and still pays good wages, although not better than those paid by the independent refiners. The employes are mostly competent and of high class. Nevertheless, the tendency, by closing down part of the refineries, is toward displacement of labor, and the centralization of industry in one organization gives it a greater control over labor than competing concerns could have. The Standard Oil Company pays very high salaries to its superintendents and department heads, so there may be no net saving in wage payments by the combination.

Mr. Clark does not consider that the wages paid by the Standard Oil Company to its employes at distributing stations are higher than those of independent dealers or than wages generally. He worked

for the company for six years, beginning as a boy of 19, and his pay was raised only from $15 per month to $2.50 a day ,the latter sum being received when he was manager of the station at Newark, O. He hired men or boys to drive hoops, fill barrels, care for drays, etc., at from 60 to 75 cents per day. They could have earned more elsewhere, but hoped to work up. Hours of labor average fully 12 per day. Mr. Mathews says that this statement as to hours of labor is misleading and untrue.

RAILWAY DISCRIMINATIONS BEFORE INTERSTATE COMMERCE ACT.

DISCRIMINATIONS ADMITTED BEFORE INTER-STATE COMMERCE ACT.

Much testimony was presented concerning the granting of special rates to the Standard Oil combination, and other forms of discriminations or advantages obtained by it from the railways. A large part of the testimony brought forward by opponents of the combination, especially so far as regards actual rebates or differences in rates, related entirely to the period previous to the adoption of the interstate commerce act in 1887. While the witnesses defending the combination presented some evidence in rebuttal as to these early discriminations, they admitted frankly that the practice of securing rebates and special rates had existed prior to the adoption of that act, while denying absolutely any violation of law since that time.

Thus Mr. Archbold testifies that previous to 1887 practically all shipments of oil, or of freight of any kind in large quantities, were made under special contracts between large shippers and the railways. The tariffs issued gave no clew to the actual rates charged. This practice was injurious, on the whole, to the shippers, and was particularly contrary to the interests of the Standard Oil Company. The various shippers, owing to the fear that some competitor might receive lower freight charges, cut prices to consumers in order to retain trade, thus often giving consumers more than the reduction from the published schedules actually secured. Since the practice has ceased the condition of business has been much more settled, and the witness attributes the increased profits of the Standard Oil Company since the passage of the interstate commerce act in part to this change. These special contracts were usually made at the instance of the railway companies, soliciting traffic of large shippers, rather than at the instance of the shippers themselves.

Mr. Page also admits that the Standard received rebates from published rates, but declares that all other oil shippers did the same, and that in certain instances others received greater rebates than the Standard. He cites as instances shipments by Scofield, Shurmer & Teagle, and also shipments from Nashville by independent dealers.

Mr. Page states further that, so far as his own experience goes, the Standard Oil Company in securing such rebates made no arrangement with the railways as to what they should charge to other shippers.

Mr. Rockefeller also admits the former universality of the practice of rebates from tariff rates. He adds as follows:

"Each shipper made the best bargain he could, but whether he was doing better than his competitor was only a matter of conjecture. Much depended upon whether the shipper had the advantage of competition of carriers. The Standard Oil Company of Ohio, being situated at Cleveland, had the advantage of different carrying lines, as well as of water transportation in the summer, and taking advantage of those facilities made the best bargains possible for its freights. All other companies did the same, their success depending largely upon whether they had the choice of more than one route. The Standard sought also to offer advantages to the railways for the purpose of lessening rates of freight. It offered freights in large quantity, carloads and trainloads. It furnished loading facilities and discharging facilities. It exempted railways from liability for fire. For these services it obtained contracts for special allowances on freights. These never exceeded, to the best of my present recollections, 10 per cent. But in almost every instance it was discovered subsequently that our competitors had been obtaining as good, and, in some instances, better rates of freight than ourselves.

Witnesses opposing the combination, however, consider that these early discriminations inured almost wholly to the benefit of the Standard Oil Company. Thus, Mr. Emery, Mr. Lockwood and Mr. Rice, in particular, declare that the growth of the Standard Oil monopoly between 1870 and 1880 was almost entirely due to railway discriminations, and other witnesses less specifically state the same thing. They claim that the Standard received large rebates from railways on shipments made by its competitors. The gross profits of the combination from discriminations are alleged to have been enormous, ranging into millions of dollars yearly.

Mr. Rice declares with great emphasis that railway discrimination was the "father and breeder of trusts." Were it not for discriminations neither the Standard Oil Company nor any other of the great combinations would have been possible. The Standard Oil Company was the first and may be considered the parent of all trusts. It had a direct influence in the organization of many later combinations.

As to the question whether the Standard Oil Company in its earlier days received payment from the railways on oil shipped by its competitors, Mr. Rockefeller, in an affidavit submitted to the commission, stated that he knew of no such instance. The only case where such an arrangement was temporarily entered into was that of George Rice, hereafter referred to, which was made by an agent and which was repudiated by the company, the money received being refunded.

Mr. Page also testifies that, so far as his own experience goes, no such rebates on shipments by competitors have been received.

Mr. Rockefeller also denies that the Standard Oil Company increased its profits by the advantages it received from railways. "Whatever advantage it received in its constant efforts to reduce rates of freight was deducted from the price of oil. The advantages to the Standard from low freight rates consisted solely in the increased volume of its business arising from the low price of its products."

SOUTH IMPROVEMENT COMPANY.

The first conspicuous case of discriminations between shippers in the oil business was in connection with the South Improvement Company, as to which much testimony was presented.

1. Organization and Relation to Standard Oil Company—Opponents of the Standard combination maintain that the South Improvement Company was organized by the same men who formed the Standard combination, and that the methods of the company were continued by the Standard. Mr. Lockwood declares that 10 out of 13 incorporators of the South Improvement Company were later connected with the Standard combination. Mr. Emery and Mr. Rice, on the basis of the testimony of William G. Warden before a committee of Congress on March 30, 1872, quote the list of stockholders of the South Improvement Company as follows: William Frew, 10 shares; W. P. Logan, 10 shares; John P. Logan, 10 shares; Charles Lockhart, 10 shares; Richard S. Waring, 10 shares; W .G. Warden, 475 shares; O. F. Waring, 475 shares; P. H. Watson, 100 shares; H. M. Flagler, 180 shares; O. H. Payne, 180 shares; J. A .Bostwick, 180 shares; William Rockefeller, 180 shares, and John D. Rockefeller, 180 shares. Of these men Messrs. Flagler, Payne, William Rockefeller, J. D. Rockefeller and Bostwick were members of the Standard Oil Company.

Mr. Boyle, editor of the Oil City Derrick, believes that the South Improvement Company had its origin among the railways rather than among refiners, and states that the conviction was general in the oil region that the Pennsylvania Railroad and others were really behind the organization. The change in the locality of the production of oil toward the south tended to reduce the business of the Erie and New York Central railroads in handling oil, and they sought this agreement with a view to keeping up their proportion of the traffic. The agreement was made with certain Philadelphia, Pittsburg and Cleveland refiners. The South Improvement Company purchased one of the numerous special charters which had been granted by the legislature prior to the new constitution of 1873. This charter had been intended chiefly for other purposes, but was very broad in its scope.

Mr. Emery submitted the full text of the charter of the South Improvement Company. From this it appears that by act of the Pennsylvania legislature of May 1, 1871, the South Improvement Company was created and vested with all the powers conferred by the act of April 7, 1870, on the Pennsylvania Company. The powers of this company, as shown by its act of incorporation, were extremely broad, including the authority "to construct and operate any work or works, public or private, designed to include, increase, facilitate, or develop trade, travel, or the transportation or conveyance of freight, live stock, passengers, or any other traffic, by land or water, from or to any part of the United States." The company was also empowered to exercise the right of eminent domain, for the purpose of erecting any work in connection with the exercise of its powers, and to hold the securities of other companies, or in any other way to combine with them.

2. Contract With Railroads—Mr. Lee, Mr. Lockwood and Mr. Rice refer in greater or less detail to the contract made between the South Improvement Company and the trunk railroads reaching the oil regions, securing discriminating rates in favor of that company. The testimony of Mr. Emery on this point, however, is much more detailed and is followed in the summary given below.

Mr. Emery submitted a copy of the contract between the South Improvement Company and the Pennsylvania Railroad, dated June 18, 1872. By this contract the South Improvement Company agrees to ship 45 per cent. of all the oil transported by it over the Pennsylvania Railroad, and to divide the remainder equally between the Erie Railway and the New York Central. The South Improvement Company also agrees to furnish suitable tankage facilities for shipping petroleum and receiving it at its destination, and to keep records of the amount of petroleum and its products shipped over the railroads concerned, both by itself and other parties.

The railways agree to allow the South Improvement Company rebates on all petroleum and its products carried by them, and to charge all other parties not less than the full rates specified in the contract. These gross rates, according to several witnesses, were very much higher than those previously existing. The railroads also agree to furnish to the South Improvement Company manifests and way-bills of all petroleum or its products transported over their lines by all parties whatever.

It was, however, provided that similar rebates and advantages should be paid to any other party who should furnish an amount of transportation equal to that furnished by the South Improvement Company, and equal facilities for promoting the petroleum trade. This is the provision under which it is claimed that all parties had equal opportunities and advantages from the railways. Mr. Emery, however, insists vigorously that it would have been absolutely impossible for anyone else to secure the amount of business necessary to meet this requirement of the railways. The very contract itself prevented any competitor from obtaining such equality in business.

A further clause of the contract provides that the railway "shall at all times co-operate, as far as it legally may, with the party hereto of the first part, to maintain the business of the party hereto of the first part against loss or injury by competition * * * and to that end shall lower or raise the gross rates of transportation over its railroads and

connections, as far as it legally may, for such times and to such extent as may be necessary to overcome such competition."

The following are some of the gross rates and rebates provided for in the contract:

Rates and Rebates According to Contract.

ON CRUDE PETROLEUM.

	Gross rate *	Rebate*
From any common point to—		
Cleveland	$0 80	$0 40
Pittsburg	80	40
New York	2 56	1 06
Philadelphia	2 41	1 06
Baltimore	2 41	1 06
Boston	2 71	1 06

ON REFINED OIL, ETC.

From Pittsburg to—		
New York	$2 00	$0 50
Philadelphia	1 85	50
Baltimore	1 85	50
From Cleveland to—		
Boston	2 15	50
New York	2 00	50
Philadelphia	1 85	50

*For each barrel of 45 gallons.

Mr. Emery insists that this contract between the South Improvement Company and the Pennsylvania Railroad was actually signed and went into effect, notwithstanding statements to the contrary. He quotes from the testimony of P. H. Watson, president of the South Improvement Company, before a committee of Congress on April 5, 1872, in which Mr. Watson stated that the contract was approved by the board of directors of the South Improvement Company at a meeting at which he (Mr. Watson) was not present. The original contract has been submitted in evidence in previous investigations and is signed by P. H. Watson and by J. Edgar Thompson, president of the Pennsylvania Railroad.

Mr. Rice declares that the arrangement by which the South Improvement Company was to receive rebates on all oil shipped by its competitors meant that practically the rebates paid to the Standard on each barrel of oil shipped by itself were 19 times greater than the nominal amount of rebate provided in the contract, since the shipments of independent refiners were 19 times greater than those of the Standard Oil Company. On this basis he calculates the amount of rebates received by the South Improvement Company as arranged from $7.60 to $25 per barrel.

Mr. Archbold testifies that the contract entered into by the South Improvement Company and the railways was abolished before it became operative. He has no knowledge that a similar contract was shortly afterwards made with the Standard Oil Company, and denies that the Standard in any sense continued the policy of the South Improvement Company. He has always disapproved of that company.

3. Abandonment of Discriminating Contract—So great was the indignation among oil producers and refiners over this contract of the South Improvement Company that it was cancelled almost before it went into force, and the charter of the company was subsequently repealed.

Mr. Emery submitted a copy of the report of the executive committee of the Petroleum Producers' Union describing the growth of knowledge and of public opinion concerning the contract of the South Improvement Company, and showing how the indignation meetings which were held led finally to the abandonment of that contract and to the repeal of the South Improvement Company's charter. On March 25, 1872, the railways which had been concerned in the arrangement with the South Improvement Company signed a contract with the representatives of the oil producers and refiners, agreeing that the former rates on crude and refined oil should remain unchanged and that there should be no rebates or drawbacks allowed, or any discriminations made in any way whatever. This contract contained a list of rates which should prevail—in most cases about 40 per cent. less than the gross rates provided for in the contract with the South Improvement Company.

LATER DISCRIMINATIONS DURING THE SEVENTIES.

1. General History—It was the general opinion of witnesses opposed to the Standard combination that this contract made with the railway companies was not lived up to for any length of time, but that discriminations in favor of the Standard Oil Company, fully as great and as unjust as those provided for in the contract with the South Improvement Company, continued to be made throughout the seventies. Practically all of the statements made are based on previous testimony in suits and official investigations.

Thus, Mr. Emery declares that heavy rebates continued to be paid to parties connected with the South Improvement Company and the Standard Oil Trust from 1872 up to 1880, and that it was on this account that the great majority of the refineries of the independents were driven out of business. In evidence of this he submitted extracts from the testimony of Frank Rockefeller, an independent refiner, who had been driven out of business in Cleveland, before a committee of Congress in 1876. Mr. Rockefeller testified that the members of the Standard Oil Company had not hesitated to tell competing refiners in Cleveland that unless they sold their property to the Standard Oil Company it would become valueless, because that company was receiving advantages from the railways. He heard J. D. Rockefeller and H .M. Flagler make this statement. About 20 refineries in Cleveland sold out under the influence of this threat. Mr. Rockefeller was of the opinion that heavy rebates were being paid to the

Standard Oil Company, and were being divided by that company with certain individual officials of the railways. He believed further that there was a pool or arrangement for dividing the amount of oil shipped among the various railways.

Mr. Emery also cites the testimony of George H. Blanchard, then general freight agent of the Erie Railroad, before the Hepburn investigating committee in New York, that he had become convinced that the Empire Line had received a large drawback from the Pennsylvania Railroad within two weeks after the railroads agreed not to discriminate. Mr. Emery also submitted a letter from the general freight agent of the New York Central, dated September 9, 1874, increasing the open rates on refined and crude oil materially and allowing a rebate on refined oil equal to the amount paid for the transportation of crude oil by rail from the mouth of the pipe lines to the respective refineries upon the basis of 14 barrels of crude oil to every 10 barrels of refined shipped. It was further agreed that a rebate of 22 cents per barrel should be paid on all oil coming from pipe lines maintaining the agreed rate of pipage.

Mr. Rice declares also, on the basis of existing testimony, that at one time during the seventies the freight rate from Cleveland to New York for the Standard Oil Company was nominally 60 cents per barrel, from which was deducted the amount of transportation charges on crude oil from the oil wells to Cleveland, amounting to 35 cents per barrel on crude oil, on the basis of 14 barrels of crude to 10 of refined, so that the actual rate paid by the Standard Oil Company on refined oil was only about 11 cents per barrel. The freight rate to the competitors of the Standard at the same time was $1.90 per barrel.

Mr. Rice, referring to the above-mentioned circular issued by the New York Central Railroad, in 1874, agreeing to refund 22 cents per barrel from the freight charges on oil coming from such pipe lines as maintain agreed rates of pipage, declares that this rebate practically destroyed the value of all independent pipe lines immediately. The pipe lines in the combination which maintained the agreed rates could bid 22 cents per barrel more for crude oil than their competitors and the latter could secure no business whatever. In support of this position Mr. Rice quotes the evidence of E. G. Patterson and the argument of Simon Sterne before the Hepburn committee in 1879.

Mr. Rice quotes from the testimony of Messrs. Lombard, Bush and Gregory, independent oil refiners at the seaboard, as to conversations with Mr. Scott and Mr. Cassatt, of the Pennsylvania Railroad, apparently during the later seventies. Each of these gentlemen declared that he had asked these officers whether equal freight rates would be given to them if they shipped as much oil as the Standard Oil Company. The reply was that equal rates would not be given, and that the higher the freight rates were made the greater would be the discrimination against the independent shipper. These officers stated that the Standard Oil Company was the only power that could keep peace between the trunk lines.

Mr. Emery testifies that the result of the suit of the Commonwealth of Pennsylvania vs. the Pennsylvania Railroad was the discovery of evidence which led to the finding of an indictment against John D. Rockefeller and others in 1879. The case, however, was never tried. The defendants attempted to secure a change of venue, and afterwards applied to the Supreme Court of Pennsylvania for relief, which they secured through some process of law not understood by the witness. Finally, on account of lack of funds and the fear of further delay, Mr. Campbell, president of the Producers' Protective Association, settled the case on receipt of $40,000, which was used in defraying expenses. A contract was also made by which the railroad agreed to grant no more rebates.

Mr. Lockwood testifies that in the case of Pennsylvania vs. the Pennsylvania Railroad Company it was testified by Mr. Cassatt that the open rate on oil at one time was $1.90 per barrel, while the Standard Oil Company received a rebate of $1.10 on oil shipped by itself and its competitors. The Standard also received allowances for terminal charges, the terminal facilities having been placed in its hands by the railways, which reduced the actual freight charges to 35 cents. A letter written in 1878 by Mr. Daniel O'Day to Mr. Cassatt stated that the New York Central and Erie roads were paying rebates of not less than 30 cents per barrel on all oil carried, and demanded from the Pennsylvania road a rebate of that amount, dating back several months. The rebate was granted, Mr. Cassatt having evidence that the roads above named were paying rebates, as stated, of from 20 to 35 cents. In another suit it was shown that the profits of the Standard Oil Company during four years at this period were more than $2 per barrel of oil.

Mr. Rockefeller, in an affidavit replying to interrogatories, states that to the best of his recollection the greatest rebates were paid by the railways from 1877 to 1879. The Standard then had an agreement for the special 10 per cent. commission, and in addition rebates amounting, as the witness believes, to 64½ cents on refined oil were paid by the railways to equalize with shipments made by the Erie Canal. These rebates, however, were open to all persons who shipped by rail. The impression of Mr. Rockefeller is that the Erie Railway, at least, did not collect the higher rate from the shippers and later make rebates from it, but actually lowered the rate to all shippers.

2. Empire Transportation Company—Mr. Lee and Mr. Rice refer to the discriminations made by the railways against the Empire Transportation Company by which it was driven out of business. In 1877 and 1878 freight rates were cut to eight cents per barrel during this fight.

Mr. Archbold explains the transaction by which the Standard Oil Company absorbed the Empire Transportation Company, referred to by Mr. Lee. The Empire Line and the Green Line were corporations whose stocks were owned by the officers and

managers of the Pennsylvania road. Through these companies the railway became interested in pipe lines and in oil refining. The Standard claimed that the road discriminated in favor of its own refineries. In view of this fact the Standard Oil Company refused to ship over the road, and thereby finally forced the sale of the pipe lines and refineries to the Standard Oil Company.

3. Gross Amount of Rebates, 1877-1879—Several witnesses referred to the testimony of Mr. Cassatt, in the case of the Commonwealth vs. Pennsylvania Railroad, in 1879, as to the high rebates paid from 1877 to 1879; and also to the estimate made by Mr. Emery before the House Committee on Manufactures in 1888 that the gross amount of rebates received by the Standard from October 17, 1877, to March 31, 1879, was no less than $10,155,218.

Mr. Archbold explains the methods employed by Mr. Emery in making the estimates referred to by Mr. Lee as to the amount of rebates received by the Standard Oil Company from 1877 to 1879. Mr. Emery calculated that the Standard Oil Company received a rebate of 64½ cents per barrel on refined oil, and various rebates, ranging from 29 cents to 22½ cents, on crude oil. He took the average of all these figures, claiming 55 cents as the average rebate thus received by the Standard Oil Company. He then calculated this rate of rebate upon the entire consumption of oil in this country, from October 17, 1877, to March 31, 1879, reaching the total of $10,155,218. This involved the entirely false assumptions that all oil consumed was shipped eastward, and all shipped by the Standard Oil Company; that all trunk lines paid the same rebate as the Pennsylvania Railroad; that the shipments of oil on which 64½ cents rebate was paid equaled the shipments of oil at the lower rebates. The evidence of Mr. Cassatt refers only to one trunk line, the Pennsylvania Railroad, and shows the following facts:

"I. That the Standard Oil Company shipped no oil over the Pennsylvania Railroad until July, 1875. That the Pennsylvania Railroad was then interested in refining in competition with the Standard, and not only allowed the Standard no preferences, but discriminated against it to such an extent that the Standard stopped shipping over the road in March, 1877.

"II. That in October, 1877, the Pennsylvania Railroad and the Standard entered into an agreement by which the Standard Oil Company was to have a commission of 10 per cent. on all freight furnished by it in consideration of the Standard agreeing to equalize oil freights on the four trunk lines.

"III. That this agreement did not effect a discrimination even to that extent as against other shippers over the Pennsylvania Railroad prior to May 1, 1878, because said shippers had contracts extending to that date, which were excepted in the contract with the Standard.

"IV. That the Pennsylvania Railroad was willing and offered to carry oil for all shippers on the same terms with the Standard, excepting only 10 per cent. commission, for which it demanded like considerations.

"V. That it did continue to carry for all shippers who did all their business over its line as low as for the Standard, commission included.

"VI. That shippers not using the Pennsylvania Railroad were able, after May 1, 1878, to get oil east by the Erie Canal lower than by rail, and shipped their oil by that route, in consequence of which the Pennsylvania Railroad shippers were paying greater freight rates than other shippers.

"VII. In consequence the Pennsylvania rate was reduced to those who continued to ship by that line 44½ cents on refined, making the net rate $1, said 44½ cents being paid as rebate.

"VIII. For the same reason, namely, to meet canal rates, in July, 1878, the rate to those who shipped by rail was further reduced 20 cents, the 20 cents being paid as a rebate, and refunded back to May 1, 1878.

"IX. That these rebates were paid to all shippers who shipped entirely by rail, and were for the express purpose of putting them on an equality with those who shipped by canal.

"X. The same is true of the rebate allowed on crude oil during the same period, except 10 per cent. paid to Standard and 22½ cents paid to the American Transfer Company, the latter being the pipe line's share of a through rate.

"XI. That the rebates which were paid from May 1,1878, to equalize rail and canal shipments, were discontinued December 8 of the same year, when the canal was closed.

"XII. All payments of rebates entirely ceased March 31, 1879."

Mr. Emery defended the estimate made by him, reaffirming his testimony on this subject presented before the House Committee on Manufactures in 1888. The three separate figures for rebates, which were taken to secure the average of 55 cents, on which Mr. Emery based his estimate, were, respectively, 64½ cents, 51½ cents and 49 cents. The calculation of these rebates on the entire amount of oil shipped in every direction and by all the railroads is, in Mr. Emery's opinion, justifiable, since rebates are known to have been paid by all roads on practically all oil shipped. It appears that Mr. Cassatt also admitted in the case above referred to that the Pennsylvania Railroad alone had paid fully $4,000,000 in rebates during this period, which is about the proportion calculated by Mr. Emery as paid by that road. Mr. Emery submitted in evidence the book of testimony in the case above named.

4. Tidewater Pipe Line, 1879—Mr. Rice states that in 1879 the Tidewater Pipe Company laid a six-inch pipe to Williamsport, Pa., and secured special rates from the Reading and Central New Jersey railroads to the seaboard. In order to compel this company to sell out to the Standard Oil Company competing railways cut rates on freight to 15 cents per barrel from the oil regions to the coast, this amount barely paying for the fuel used in the engine. In support of this statement Mr. Rice quotes from the annual report of Mr. Gowen, president of the Philadelphia & Reading Railroad.

ARRANGEMENTS BETWEEN PIPE LINES AND RAILWAYS.

1. Contract of National Transit Company and Pennsylvania Railroad, 1881—Mr. Rice quotes from a letter of Mr. Newlin, attorney for the plaintiffs, in the case of Fennaille & Despeaux vs. the Pennsylvania Railroad Company, in the circuit Court of the United States for the eastern district of Pennsylvania. This letter states that it was proved in that suit that a contract was made on May 6, 1881, between the National Transit Company and the Pennsylvania Railroad Company, by which the transit company guaranteed to the railroad one-third of the transportation of oil to the seaboard. The rates on oil thus carried, so far as furnished by the National Transit Company, were to be much lower than the open rates to the public. Thus, by way of Foxburg to Communipaw, the through rate including the charge of the local pipe line to Foxburg, 20 cents, was 68 cents. On oil furnished by the pipe line company to the railroad at Foxburg the pipe line company was to receive as its share one-fourth of this open rate, namely, 17 cents, and one-half of the difference between this one-fourth and the public rate, i. e., 68 cents, was to be paid to the railway—that is, 25½ cents was to go to the railway. The difference between the share of the open rate coming to the railroad, 48 cents, and its share of this secret rate was 22½ cents, being practically a rebate of that amount to the Standard Oil Company, although the word rebate nowhere occurs in the contract.

This same letter refers to the contract made in 1884, more fully described below.

Mr. Page states that Mr. Newlin's deduction concerning the rebates to the National Transit Company under this contract of 1881 were erroneous. The court before which the suit referred to was brought, granted a motion for non-suit on the ground that the entire case rested on a misunderstanding of the terms of this contract. Mr. Page submitted a letter from George T. Bispham, of Philadelphia. The latter explains in detail the method by which Mr. Newlin made the calculation as to the amount of rebate above referred to. Mr. Dodd's letter quotes the two sections of the contract upon which Mr. Newlin's charge is based as follows:

"The through rates from the discharging point of the gathering pipes in the region to the destination of the oil, whether the same shall be shipped entirely by rail or trunk pipe and rail, shall be fixed by the trunk line railroad companies, provided they can agree upon the same, and the transit company agrees to accept thereof as the share due to its through pipes the proportions hereinafter fixed."

"Whenever the through rate from the exit point of gathering pipe shall be less than forty (40) cents per barrel, the local or gathering pipe shall be considered as entitled to a rate equivalent to only one-fourth (¼) of the rate which shall be formed by the addition of the said through rate to the public rate which the local pipe charges, and one-half (½) of the difference between this one-fourth and the said public rate shall be considered as due to be paid to the railroad company, but this difference shall never be such as to make the local pipe receive less than ten (10) cents per barrel."

Mr. Dodd's letter states that Mr. Newlin's error consists in confounding the "through rate from exit point of gathering pipe" with the "public rate which the local pipe line charges." Mr. Newlin takes one-half of the difference between 17 cents and 68 cents, the latter being the railway rate, as the sum paid over to the pipe line company by the railways. As a matter of fact, he should have taken one-half of the difference between 17 cents and 20 cents, "the public rate which the local pipe line charges," there being no other reference to public rate in the section. This half amounts to 1½ cents instead of 25½ cents. Moreover, the entire arrangement applies only where the through rate is less than 40 cents per barrel, and Mr. Newlin's inference to the contrary is baseless.

The fact is, as stated by Mr. Page and Mr. Dodd, that the Standard Oil Company paid exactly the same rate as other shippers over the Pennsylvania Railroad from and to the various points named, but that, on such oil as was carried partly by pipe line and partly by rail, a through rate was made, of which the pipe line naturally received a share. At this time the seaboard pipe line of the Standard did not reach beyond Hamilton, Pa. In order that the railway might be compensated in part in case it made an exceedingly low rate of freight, below 40 cents per barrel for the through rate, the pipe line company agreed to take a part of the charge of its local pipes, which are to be clearly distinguished from its seaboard line, and pay it to the railway. So far from any rebate being made in favor of the Standard, this might be considered a rebate in favor of the railway.

2. Contract of National Transit Company and Tidewater Pipe Company, 1883—Mr. Rice testifies that on October 9, 1883, an agreement was made between the National Transit Company and the Tidewater Pipe Company, which had previously been competing, for a division of traffic, the Tidewater Pipe Company being allowed 11½ per cent. of the total pipe line transportation. Within three months after this contract was made the railways advanced the tariff rate on refined oils by 87½ cents per barrel, thus giving a great advantage to the Standard Oil Company, which could pipe its oil to the seaboard at a cost estimated by Mr. Rice as amounting to seven cents per barrel, and could then refine it there. Mr. Rice declares that the contract made with the Pennsylvania Railroad Company in 1884, more fully described by Mr. Emery, was intended to influence the railroad to maintain high rates to the seaboard, thereby giving the Standard a great advantage through its ownership of the seaboard pipe lines. Although this contract of 1884 may not now be actually enforced, the railways and the pipe lines still charge precisely the same rates to the seaboard, and these rates are very much higher than those which were charged by the railways prior to the agreement with the pipe lines. This statement is upheld by a quotation from Mr.

Franklin B. Gowen, formerly president of the Reading Railroad.

3. Contract of 1884 Between National Transit Company and Pennsylvania Railroad—Mr. Emery refers to the contract made in 1884 between the National Transit Company and the Pennsylvania Railroad, a copy of which was submitted. This contract contains the following clauses:

"The transit company agrees that all petroleum brought to the Atlantic seaboard by all existing carriers, whether rail or pipe, now engaged in transporting such property, or which may hereafter engage in such transportation in conjunction with the transit company's pipe lines, shall be ascertained monthly, and so much of it as shall have been shipped in the refined state shall be reduced to its equivalent in crude oil by considering that one and three-tenths (1 3-10) gallons of crude are required to make one (1) gallon of refined oil. It further undertakes and agrees that if of the total so transported the railroad company shall not have moved in its cars twenty-six (26) per centum thereof the transit company shall cause to be delivered to cars furnished by the railroad company at Milton, Pa., such quantity of crude petroleum as shall, when added to the amount which has been actually transported by the railroad company to the seaboard in said month, make the total transported by the railroad company in said month equal to twenty-six (26) per centum."

"The railroad company shall be entitled to one-half of the current through rates thereon."

It was further agreed that all joint rates for the transportation of oil from any delivery point of the local pipe lines to any refining or terminal point should be fixed by the railroad company in concurrence with the transit company. It was also provided that the rates on refined oil and other products should be fixed upon the following basis: From railroad stations in the oil regions to any eastern point the rates should equal 1.3 times the current rate on crude oil to the same point; from Pittsburg the rate to the east should be equal to 1.3 times the current charge on crude oil to such eastern point from rail points south of Oil City, deducting 1.3 times the charges for moving a barrel of crude oil from the local pipe to Pittsburg.

By another contract made on the same day it was provided that, instead of the railway company being compelled to furnish cars and transport the additional oil which might be delivered to it by the National Transit Company to make up the 26 per cent. agreed upon, the National Transit Company itself should transport through its pipe such extra quantity. The transit company should then pay to the railway on the oil thus carried by itself the amount of freight payable to the railway at the rates provided for in the other contract, deducting a sum ranging from six to ten cents per barrel as its compensation for transporting this oil.

Mr. Emery declares that the purpose of this contract was to keep up railway rates in order that independent shippers might not have equal facilities for shipping their oil to the seaboard. The railway accepted the percentage of traffic assigned to it as a compensation for thus keeping up rates. According to Mr. Emery the actual cost of transporting oil in a pipe line from the oil regions to the seaboard is not more than five cents per barrel. Were it not for this contract they would have sought oil freight by cutting rates very materially. As it is, the rate fixed at the time of this agreement, by the consent of the National Transit Company, as provided, was 45 cents per barrel. It has since been raised and is at present 52.1 cents per barrel in bulk.

Mr. Emery declares further that about 26 per cent. of petroleum products would necessarily be transported by rail in any case. Lubricating oil, tar, gasoline, etc., cannot be shipped through pipe lines.

The witness believes that this contract, or one essentially the same, is still in force. He bases this statement upon the fact that a representative of the Buffalo, Rochester & Pittsburg Railroad at one time proposed to Mr. Emery to arrange for shipping oil over that road to the Erie Canal, saying: "They do not see fit to recognize us as an oil road, and I am going to do some of this business." As soon as these negotiations became known, however, the Buffalo & Rochester received its proportion of the business and discontinued the arrangements with Mr. Emery.

Mr. Rice submitted a letter from Mr. Newlin showing that it had been proved in the case of Ladenburg, Thalmann & Co. vs. the Pennsylvania Railroad Company, that under this contract of 1884 there had regularly been a deficiency in the share of the oil transported by the railway company. The following statement of the settlement for the month of September, 1884, furnished by the comptroller of the National Transit Company, shows the working of this system:

Total number of barrels so transported		1,574,961
Railroad company's share		409,490
Amount carried by railroad		325,596
Deficiency		83,894
On this deficiency the railroad company was allowed on New York oil, at one-half of the current through rate, 45 cents, equals 22½ cents per barrel, on 43,665 barrels	$9,824 63	
Less compensation allowed transit company for pumping the same, at 9 cents	3,929 85	
Total	$5,894 78	
The railroad company was allowed on Philadelphia oil for 40,229 barrels, at one-half current through rate, 40 cents, equals 20 cents per bbl.	$8,045 30	
Less allowed National Transit Company for pumping same, at 8 cents	3,216 32	
Total	$4,827 48	
Total payment by the National Transit Company to the Pennsylvania Railroad Company for deficiencies for the month ending Sept. 30, 1884	$10,722 26	

Mr. Dodd, solicitor of the Standard Oil Company, in a letter submitted by Mr. Page, explains the reason for the arrangement provided for in the contract above referred to. The pipe line of the combination had just been completed to the seaboard. It could

not have reached that point without the consent of the railway company, as no free pipe line law then existed in New Jersey. It was still necessary to have a traffic contract with the railroads and to deliver oil to the railroad at different points for shipment to Philadelphia. Accordingly, in addition to agreeing to divide the rates on oil carried by pipe lines and partly by rail, in the same way as was provided by the contract of 1881, it was further agreed that if the railway company did not move 26 per cent. of the oil the transit company should pay it the deficiency.

4. Pipe Lines in Ohio—Mr. Rice states that it was testified by Mr. O'Day, general manager of the pipe line system of the Standard Oil Company, in 1888, that the Chicago & Atlantic Railroad allowed the combination to lay its pipe lines on the railway's right of way from the Lima oil fields to Chicago without charge, in view of the profit to be received from the transportation of the material for constructing the line. After the pipe line was completed the railway rates on oil were raised from 20 to 87 per cent. above those formerly existing, to the injury of independent shippers of oil. The present rate from Lima to Chicago is 40 cents per barrel, which is eight times as much as it costs the Standard to pipe its crude oil to its great refinery at Whiting.

Mr. Rice testifies that the receiver of the Cleveland & Marietta Railroad allowed the Standard Oil combination to lay its pipe lines on the railroad's right of way from the Macksburg field to Parkersburg, W. Va., but refused to allow the pipe line of the witness even to cross the tracks of the railroad.

REFUSAL TO FURNISH CARS.

Mr. Emery, when he was producing oil in the Bradford field and operating a refinery at Philadelphia, was unable to secure tank cars for transporting his crude oil to the refinery. The Pennsylvania Railroad owned 1,126 cars; but, as the witness believes, by order of the Standard Oil Company, all but 248 of these cars were sent out of the State, and he was unable to secure more than one in a week or longer for carrying on his business. An officer of the Rochester & Pittsburg Railroad told him that that road was threatened with a loss of its coal traffic if it hauled Mr. Emery's oil.

Mr. Lockwood also stated that one of the chief ways in which the railways discriminated against the independent refiners was by refusing to furnish cars to men who had oil to ship, or by furnishing only a few, or by delaying them unduly.

DISCRIMINATIONS AGAINST MR. GEORGE RICE.

1. Relations Between Mr. Rice and the Standard—Mr. Rice, who has owned a refinery competing with the Standard Oil Company, at Marietta, O., since 1876, makes numerous charges of discriminations against himself by the railway companies, especially on shipments toward the south. Most of these charges relate to the period previous to the passage of the interstate commerce act.

Mr. Lockwood also refers to the discriminations against Mr. Rice, but his statements are less detailed than those of Mr. Rice himself, and need not be summarized.

Mr. Archbold testifies that Mr. Rice has not for many years been directly occupied in refining, but has made a business of attacking the Standard Oil Company—in which Mr. Archbold believes he has been financially aided by other opponents of the company—and of attempting to compel it to buy out his refinery at an exorbitant price. As far back as 1886 he demanded $500,000 for the refinery, which was worth possibly $25,000 or $30,000. He based his demand on the statement that he had already inaugurated a number of suits before the Interstate Commerce Commission, and would push them unless it were granted. He also threatened to injure the Standard Oil Company by making what are known as "cut quotations" in the market for refined oil. In support of these statements concerning Mr. Rice, Mr. Archbold submitted extracts from testimony of Mr. Rice on cross-examination in the suit of the State of Ohio vs. the Buckeye Pipe Line Company, taken February 20, 1889. Mr. Rice then stated that he had at one time offered his plant to the Standard Oil Company for $50,000, and still earlier for $20,000; that later on he demanded $500,000, and in June, 1890, sent one Mr. Orvis to the Standard Oil Company with a proposition to sell at the same amount, the understanding being that Mr. Rice was to do nothing further in the way of litigation or anything of that kind.

Mr. Rice's testimony in this suit also showed that he had personally employed two attorneys as counsel to assist the attorney general of Ohio in a suit for contempt instituted against the Standard Oil Company.

Replying to these statements of Mr. Archbold, Mr. Rice testifies that no one ever furnished him a dollar to aid him in any fight he has made against the Standard Oil Trust or the railroads.

Mr. Rice also declares that the charge that he attempted to blackmail the Standard Oil Company in order to compel it to pay a large price for his refinery is entirely untrue. This has been the stock in trade of the Standard Oil Company in opposing him for 18 years. Mr. Rice quotes from his previous testimony in suits against the Standard Oil Company. In this Mr. Rice stated that in 1882 Mr. F. B. Squire, the present secretary of the Standard Oil Company of Ohio, came to him at Asbury Park and offered him $250,000 for his oil properties, including his crude oil producing properties as well as the refining plant. In 1886 Mr. Rice offered his properties to the Standard Oil Company for $250,000 and $50,000 per year for five years. A letter from Mr. Archbold, dated December 13, 1886, submitted in evidence, shows that the Standard Oil Company was then willing to discuss the deal further with Mr. Rice. In 1887 the witness offered his "plant" (apparently only his refinery) at $125,000, and $25,000

annually for five years. It is not true, as charged by the Standard Oil Company, that Mr. Rice then said to Mr. Archbold that it would be better for the Standard Oil Company to make a deal with him, and that by so doing parties would be deterred from encouraging a line of action against the Standard Oil Company. The Standard has produced evidence in the form of letters from one Edgar P. Hill, addressed to the Standard Oil Company, stating that he was in a position to negotiate with Mr. Rice, and advising the company to come to some arrangement with him, owing to the effect which he might have upon public opinion, and in bringing legal proceedings against the company. Mr. Rice denies having had any arrangement or conference with Mr. Hill on this subject, and states that these letters were thrown out as being incompetent evidence in a case before the courts in 1887, although they were afterwards submitted as evidence befor the House Committee on Manufactures in 1888.

Mr. Rice declares that his property was actually worth the $500,000 which he demanded from the Standard Oil Company. It is absurd to point out that he had offered to sell during the seventies at a lower price, since he had increased his plant to five times its previous capacity, and had included in the offer his producing properties, which consisted of about 200 acres of oil land, with from 150 to 200 barrels per day production. Mr. Rice calls attention to the fact that his testimony in the Ohio investigation has been misprinted, making it appear that negotiations for the sale of his property were conducted in 1897 instead of 1887, and making it appear that he testified that the capacity of his refinery was 10,000 barrels per annum instead of 100,000.

Mr. Rice also exhibited a pamphlet prepared by himself in 1881, entitled "Black Death," together with another pamphlet of the same title, with red printing on the margin ,defending the Standard Oil Company and attacking Mr. Rice in strong language.

In rebuttal of the above evidence Mr. Page submitted an affidavit from Mr. F. B. Squire, dated December 1, 1889, stating that in 1876 Mrs. George Rice informed him that Mr. Rice wished to sell his entire oil property, including crude production, for $24,000. The affidavit continues:

"I met Mr. Rice several times after this and he kept urging the matter. In the summer of 1881 or 1882 he invited me to meet him and his wife at Asbury Park. I did so. They there made me an offer to sell the property, stop all prosecutions and be friendly with the Standard Oil Company for $250,000—$50,000 to go to me for my good office if I could bring it about. I reported the result to Mr. Archbold, including the offer to me, and it was immediately declined. I advised Mr. Rice, who called at my office the next day and stated that the company would regret this act. Immediately after this Mr. Rice published the pamphlet called 'Black Death.' F. B. Squire."

Mr. Rice submitted a supplemental affidavit denying the statements made by Mr. Squire and further explaining his negotiations with the Standard Oil Company. The affidavit states:

"The real truth of the matter is that in the year 1876 Mrs. Rice and myself were boarding in New York at the same place with said Squire, and Mrs. Rice was acquainted with a Mrs. Waring, who was also an acquaintance of said Squire. That in some conversation with Mrs. Waring the matter of the oil business came up between them, and subsequently the said Squire spoke to deponent about his oil interests and said he possibly could sell some of it to the Standard Oil Company if he was so disposed to part with it. That the result of several conversations was that deponent informed Squire that if he or the Standard Oil Company desired to purchase my refining plant (which was only a small part of my entire oil properties and interests in the oil or petroleum business) he or it could have the same for $20,000, as my wife was very desirous that I should get out of the refining business, and it was finally offered to Squire for that sum, which was not accepted.

In the summer of 1882 I was stopping with my wife at Asbury Park, where Squire, on his own solicitation, came to see me, and he then and there offered me $250,000 for my entire oil properties, including production, pipe lines, storage tanks and refinery plant. I never offered the said Squire the sum of $50,000 commission or any other sum to make said sale; nor did he suggest it or demand it, or any other sum whatever, nor did I say to him that the company would regret their act if they did not purchase from me, nor was I ever aware that said Squire had an office, except by heresay, at Cleveland, O. As this latter alleged interview occurred in the summer of 1882, as I testified before your commission, and as my pamphlet, 'Black Death,' was published on December 15, 1881, it is superfluous to swear to it, that, because said proposition was not accepted by said Standard Oil Company, I immediately published said pamphlet as retaliatory against said company."

Mr. Rice further testified that in 1889 he gave evidence of Mr. Archbold, at a special term of the Supreme Court of New York City, concerning this offer of Mr. Squire to him ,and that Mr. Archbold did not deny it. Further, in 1889, Mr. Archbold stated that in the negotiations between Mr. Rice and himself in 1886, Mr. Rice's producing property was not referred to, and that he (Mr. Archbold) now heard concerning the producing property for the first time. This, Mr. Rice declares, substantiates his statement that the early offers made by him at a low price refer only to his refinery.

2. Louisville & Nashville Railroad—Mr. Rice submitted a letter from Chess, Carley & Co., a representative of the Standard Oil Company, to Mr. Culp, general freight agent of the Louisville & Nashville Railroad:

Chess, Carley & Co., Louisville.

J. M. Culp, Esq., G. F. A.

Dear Sir:—Wilkinson & Co., Nashville, received car of oil Monday, 13th, 70 bbl., which we suspect

slipped thro' on the usual 5th-class rate—"in fact, we might say," we know it did—paying only $41.50 freight from here. Charges $57.40. Please turn another screw. Yours truly,

CHESS, CARLEY & CO.

June 16, '81.

Wilkenson & Co. were Mr. Rice's agents at Nashville. Mr. Rice declares that within five days the rates to Nashville were raised 50 per cent. He does not know whether the Standard Oil Company paid this full rate or not, but thinks it fair to presume from general experience that it did not. He admits that it is an extremely difficult thing to prove that rebates have been received.

Mr. Page refers to the alleged discriminations against Mr. Rice in connection with the above letter. He states that Chess, Carley & Co. were not then directly controlled by the Standard Oil Trust, although the Standard Oil Company of Ohio had an interest in the business. Mr. Carley was manager, with complete control. The letter quoted was written by Mr. Hathaway without the knowledge of Mr. Carley. Mr. Hathaway had formerly been in the employ of the Louisville and Nashville Railroad, and it was a common expression in the office of the railroad at that time that the machinery was loose and that it should be tightened by turning a screw. The expression, therefore, naturally crept into the letter. The shipment of oil by Mr. Rice to Nashville had been billed at less than the regular tariff rate which other shippers were paying, less than Mr. Carley was himself paying, and Mr. Hathaway calls attention to its being an error to be corrected.

Mr. Page further testifies that he believes from information that Mr. Rice received the letter above referred to with a number of statements and letters which the railway company sent to Mr. Rice in connection with a later claim made by him concerning an alleged overcharge. If the railroad had construed the letter as demanding a discrimination against Mr. Rice, it would not have allowed it to go into his hands in this way. Mr. Culp testified before the House Committee on Manufactures in 1888 that he had never seen this letter, but that he would have put the interpretation upon it which has just been mentioned.

Mr. Rice declares further regarding the above letter that he considers the explanations given of it by Mr. Culp and Mr. Carley before the House Committee on Manufactures in 1888 to be exceedingly lame and untrustworthy. He is willing to pit his own statements against those of these witnesses. It is certain that the railway rates were raised 50 per cent to Mr. Rice within 5 days.

3. Rates Higher Than from Standard's Shipping Points.—Mr. Rice also testifies that in 1885 the railway rates from Marietta to Memphis and New Orleans were suddenly doubled without previous warning. The officers of the local railway at Marietta declared that this was done solely at the instance of the connecting roads, but Mr. Rice believed otherwise. The rate was restored after some correspondence, but in the following year the rates were again raised from 43 to 162 per cent. The witness declares that rates from Parkersburg, twelve miles from Marietta, where the Standard Oil Company has a large refinery, were not raised at all. He brought suit to forfeit the charter of the Cincinnati, Baltimore and Washington Railroad and the Queen and Crescent Railroad. He proved, as he states, that the former road had discriminated in favor of the Standard Oil combination from 43 to 162 per cent. and the latter from 29 to 212 per cent. He also proved other large discriminations. The court simply contented itself with deciding that the roads must not charge less per 100 pounds on tank-car shipments than on barrel shipments. This decision, Mr. Rice declares, was not obeyed. As the result of these unfair rates, Mr. Rice was driven out of 19 of his 24 agencies, losing his business in 39 out of 73 towns, all within 5 months.

4. Rebates on Crude Oil Shipments.—Mr. Rice submitted a letter from Mr. Pease, former receiver of the Cleveland and Marietta Railroad Company, to Mr. Rapello, its solicitor, together with Mr. Rapello's reply, these letters having passed in February and March, 1885. Mr. Pease writes that Mr. O'Day, representative of the Standard Oil Company, had compelled Mr. Terry, of the railroad, to make a 35-cent rate on all oil shipped from the Macksburg field to Marietta by other shippers than the Standard, and to pay to the combination a rebate of 25 cents per barrel on all oil thus shipped, making $25 per day, approximately, of clear money on Mr. Rice's oil alone. The Standard Oil Company itself was to pay only 10 cents per barrel. The receiver queries as to whether he might not be prosecuted on the ground of unjust discrimination. Mr. Rapello replies that such a prosecution might be possible, but believes that the profits from the arrangement with the Standard Oil Company, whose shipments are very much greater than those of Mr. Rice, are sufficient to compensate for any losses or sums which would have to be refunded.

Mr. Rice declares that he very soon discovered the discrimination which was being made against him, the former rate of 17½ cents per barrel having been doubled in order to make the 35-cent rate. Suit was brought against the railway company in the United States Cincuit Court, and Judge Baxter ordered the receiver to be removed. In his opinion, which is quoted by Mr. Rice, he recites as proven the facts above referred to concerning the discrimination, and declares that the desire of the receiver to increase his earnings does not justify such discrimination. "Railroads are conctructed for the common and equal benefit of all persons wishing to avail themselves of the facilities which they afford. * * This franchise carried with it other and correlative obligations. Among these is the obligation to carry for every person offering business, under like circumstances, at the same rate. Unjust discriminations are in violation of sound public policy and are forbidden by law."

A master was appointed to ascertain the amount

of rebates paid on Mr. Rice's oil to the Standard Oil Company, and this amount was duly recovered by him.

Mr. Rice states that the decision of Judge Baxter was made before the passage of the interstate commerce act, showing that, in the opinion of the courts, discriminations were illegal without any special statute. In fact, the addition of a penalty of fine and imprisonment by the interstate commerce act is considered by Mr. Rice to have had practically no beneficial effect, since the law is continually violated.

Being questioned as to whether receivers are not forced to make discriminations in order to compete with other roads which make discriminations, Mr. Rice declares that receivers, being representatives of the courts, ought to be especially circumspect in conforming to the law, whatever might be the effect upon the earning power of the railway.

Regarding this last-mentioned case, Mr. Archbold quotes all the most important parts of the testimony of Mr. O'Day before the Committee of the House of Representatives in 1888. Mr. O'Day then testified that an arrangement was made by him in 1882 or 1883 with the Cleveland and Marietta Railroad Company for a through freight rate from the Macksburg, Ohio, oil fields to Marietta by pipe line and railway. The joint rate was to be 35 cents per barrel, and it was Mr. O'Day's opinion that 20 cents was to go to the pipe line, which was a Standard organization, and 15 cents to the railway, although a letter was submitted as evidence to show that the railway received only 10 cents. Mr. O'Day further testified that this rate of 35 cents was to apply to all oil transported by the railway, whether passing through the pipe line or not. At first it was arranged that a rebate equal to the proportion of the joint rate going to the pipe line should likewise be paid to the Standard Oil Company on all oil. About $200 or $250 was thus paid by the railway on oil not passing through the pipe line, but this sum was returned to the railway by the advice of Mr. Dodd, solicitor of the Standard Oil Company. This refunding was made before suit was brought to dismiss the receiver of the railway, a porceeding with which the Standard Oil Company had nothing to do.

Other statements of Mr. Rice refer to the period since the interstate commerce act.

RAILWAY DISCRIMINATIONS SINCE INTERSTATE COMMERCE ACT.

GENERAL STATEMENTS.

1. Opponents of Combination.—Much evidence was submitted on both sides as to the question whether rebates and other forms of discriminations in favor of the Standard Oil combination are being granted at present. Little testimony was brought forward to prove that it still receives actually lower rates for shipments over the same tracks than its competitors. The chief instance which it was endeavored to prove had to do with the underbilling of the weight of cars by the Standard. This is taken up in detail later on. Much evidence was also submitted as to (1) advantages in tank-car shipments over barrels; (2) lower rates where the Standard's shipments are the largest than where the independent refiners chiefly ship; (3) indirect advantages of different sorts.

Witnesses testifying in opposition to the Standard Oil combination, however, are of the opinion that direct discriminations and rebates are still received by the Standard Oil combination This opinion is expressed by Messrs. Lee, Lockwood, Emery, Phillips and Davis.

Mr Rice testifies that the officials of the Standard Oil Company are either presidents or directors in companies controlling one-fifth of the total railway mileage of the United States, and attributes this fact to their having secured discriminations from railways in the oil business. At a comparatively early date various railway officials had taken stock in the Standard Oil Company and the relation between the combination and the railways is still exceedingly close. Mr. Rice believes that railway tariffs on oil were formerly and are still practically dictated by the Standard.

Mr. Page denies the charge that railway tariffs are ever issued from the office of the Standard Oil Company in New York, although he admits that the company has of course consulted with railroads in regard to the tariffs, as all large shippers probably do.

Mr. Page further denies that any official of the Standard Oil Company who is connected with any railway has ever made a special rate or arrangement for the Standard Oil Company, or has ever asked for any undue share of the business of that company. The Standard's business itself would necessarily suffer if attention were thus paid to the individual interests of different stockholders.

Mr. Rockefeller makes practically the same statement as Mr. Page.

Mr. Rice expresses the opinion that the railways evade the interstate commerce act by paying commissions to nominal agents for securing freight, although he doubts whether the Standard Oil Company finds it necessary to employ agents in order to secure such commissions.

Mr. Page denies absolutely that the Standard has ever received, either directly or indirectly, any commissions from railways since the inter-state commerce act.

Mr. Emery sudmitted as evidence of the existence of discriminations generally the letter of the receiver of the Baltimore and Ohio Railroad to the Interstate Commerce Commission, dated December 22, 1898. This letter states:

"Within the territory north of the Ohio river and east of the Mississippi the railroad carriers are transporting the larger part of the interstate traffic at rates less than those shown in the published tariff filed with your commission, which are by statute the only lawful rates.

"While this condition continues there will exist

the unjust discriminations and the unjust preferences and advantages between persons, localities, and particular descriptions of traffic, the prevention of which is the main object of the act of Congress establishing your commission. Only by securing the uniform charging of the published rates can the just equality of service and of charge required by law be secured either between persons or between localities."

The letter goes on to say that such discriminations and secret rates have been to some extent checked by joint associations of railways. Since under the decision of the Supreme Court of the United States joint associations and agreements are held illegal, the railway company applies to the interstate commerce commission to vigorously enforce the law, and agrees to co-operate with the commission in so doing, both by itself maintaining rates and by giving information concerning violations of the law by other common carriers.

Referring to the above letter of Receivers Cowen and Murray, Mr. Page denies that the Standard Oil Company has ever received any rebates or advantages from the Baltimore and Ohio Railroad since the passage of the inter-state commerce act.

2. General Denial.—Mr. Archbold, vice president of the Standard Oil Company, replying to Mr. Lee's testimony, denies that the Standard Oil Company has received rebates of any sort from railway companies since the passage of the inter-state commerce act in 1887. The only case specifically referred to by Mr. Lee goes back to 1889 and was not strictly a case showing discriminations in favor of the Standard Oil Company, but rather discriminations, so called, in favor of the tank shippers as compared with barrel shippers of oil.

The Standard Oil Company has sought to uphold the inter-state commerce act in every way, and is decidedly in favor of that act. It is possible that railways have since the law was passed offered rebates to the Standard Oil Company, but if so it has always refused and will continue to refuse to accept them. The witness submitted letters from officers of the leading railways of various sections of the country in reply to a circular inquiry sent out by the Standard Oil Company, asking whether the respective roads had been granted any advantages to that company, "either by direct tariff, rebate, underbilling, or in any other way." These letters each specifically deny that any such preferences have been given to the Standard Oil Company, and many of them further state that the Standard Oil Company has used its influence with the railways to maintain agreed tariff rates and to support the inter-state commerce act. The letters referred to are from the following railways: Atchison, Topeka and Santa Fe; Baltimore and Ohio; Boston and Maine; Chicago and Alton; Chicago, Milwaukee and St. Paul; Chicago and St. Louis; Delaware, Lackawanna and Western; Erie Railroad; Great Northern; Lake Shore and Michigan Southern; Louisville and Nashville; New York Central and Hudson River; Northern Pacific; Pennsylvania Railroad; St. Louis and San Francisco; Southern Pacific; Southern Railway; Union Pacific; Wabash Railroad; Western New York and Pennsylvania.

Mr. Archbold further states that it is suspected that the competitors of the Standard receive some advantages and special rates. He refers also to the low rates received by the United States Pipe Line on rail shipments in New Jersey.

Mr. Phillips denies that the independent refineries receive any advantages or discriminations from the railways. The low rates received on oil from the terminus of its pipe line in New Jersey to New York are open rates, and in proportion to the rates from Oil City and other more distant shipping points.

Mr. Page repeatedly makes the same assertion as Mr. Archbold, that the Standard has received absolutely no advantages from the railways since the passage of the inter-state commerce act, and asserts that in his position as an officer of the Union Tank Line Company he would be certain to know of any such discriminations. He asserts that it is impossible to doubt the truth of the statements made by the presidents and officers of the various railways whose letters on this subject are quoted by Mr. Archbold. He adds that the reasons why the Standard has not received and asked for rebates, in spite of the well-known fact that some large shippers have received such advantages since the passage of the inter-state commerce act, are, first, because to do so would be against the law, and secondly, because the company knows from past experience that if it receives cut rates on oil shipments, other oil shippers will do the same.

Mr. Page likewise comments upon the fact that the opponents of the combination, notwithstanding their active efforts to prove violations of law, have during more than 12 years been able to bring forward only one case, which is explained as being a clerical error. It would have been impossible, in view of the immense number of railway employes, to keep rebates and discriminations secret.

In the further refutation of the general evidence as to the importance of discriminations in favor of the Standard Oil Company, Mr. Page submitted evidence to show that the total tonnage of oil moved by the railroads of the United States is less than one-half of 1 per cent of the entire tonnage.

Mr. Rockefeller, in an affidavit submitted to the commission, made the following statement on this subject:

"7. Q. Has the Standard Oil Company received any financial favors from any railroad since 1887?—A. To my knowledge, none whatever.

"8. Has the ownership of stock in railroad companies by officers of the Standard Oil Company given the Standard any advantages with those railroads over its competitors? If so, give particulars. A. It has not. Stockholders and officers of the Standard have invested in stock of railway companies. But in no instance have they done so for the purpose of influencing the policy of the railway companies, nor to the best of my knowledge and belief has any attempt ever been made through

such ownership to influence any railway in favor of the Standard."

3. Rejoinder.—In view of the statements of numerous railway officers that no discriminations have been granted to the Standard by their roads, Mr. Emery declares that these high officers may perhaps be ignorant of the existence of discriminations which are actually made. He would desire to have the auditors and bookkeepers compelled to testify and the books of the companies brought into Court. In the case below referred to against the Pennsylvania Railroad information of rebates was secured in this way, when the president and general freight agent of the road had sworn that none had been paid. The witness believes that that company would have paid almost any sum to prevent its books from being examined by the Courts.

Mr. Emery believes that railway discriminations are responsible for the oppressive monopolies which exist in almost every line of business; that but for them there would have been no trusts. He refers to the excessive prices of coal in the northwest as showing a combination in that business.

Referring to the above series of letters from railway managers, Mr. Rice declares his belief that the Southwestern Railway Company, at any rate, actually does indulge in freight discriminations, such as are charged by Receivers Cowen and Murray, of the Baltimore & Ohio Railroad.

LOGAN, EMERY & WEAVER CASE.

Mr. Emery states that the case of Logan, Emery & Weaver vs. The Pennsylvania Railroad Company was brought in 1887, but was continued until 1890, largely through the delays of the railway. The president of the Pennsylvania Railroad, and its general freight agent, testified in 1890 that positively no rebates had been paid, at least since 1887. But the auditor and assistant auditor of the road, as well as a bookkeeper who had been employed in keeping the accounts of one department for twenty-six years, testified that rebates of from 8 to 28 cents per barrel had been granted since 1887. Mr. Emery also quotes the testimony of B. B. Campbell in this suit, showing that the Bear Creek Oil Refining Company, with which Mr. Campbell was connected, had received rebates on shipments form Coleman Station to Philadelphia, Communipaw, and Bolivar, from October 1st, 1884, to July 1st, 1888, a year and a half of this time being after the passage of the Inter-State Commerce Act. The total amount of rebates received was $48,101. After long delay and difficulty the Court issued an order requiring the Pennsylvania Railroad to produce its books, and these were actually brought to the place of trial. They were, however, never examined. The witness believes that they would have incriminated the officers of the company, and that it would have been willing to pay a very large sum to escape showing them. The attorney of the railroad accordingly approached the plaitniffs and offered to settle the case. Mr. Emery's partners were very much discouraged, and disgusted, and were too poor to carry the suit further. They feared that the railway company would succeed in continuing its dilatory methods and piling up the expenses of the case. Accordingly the proposed settlement was finally accepted, the railway paying $35,000 and the expenses of the suit. It does not appear that the Standard Oil Company was concerned in this case.

The above evidence was confirmed in its general outlines by Mr. Lee, who was attorney in the suit.

FAVORABLE RATES FROM STANDARD SHIPPING POINTS.

1. General statements.—Considerable evidence was also presented to show that the Standard receives peculiar advantages in the way of lower freight rates from its larger shipping points than prevail from points where its competitors make most of their shipments. The representatives of the Standard Oil Company state that the only advantage enjoyed by the combination results from the location of its refineries at places nearer to the point of consumption. The large number of refineries owned by the Standard in different places makes the average distance which it must ship less than that of the independent refiners having a single establishment. So far as rates per mile are sometimes less from one point than from another, this is a common practice among railways, depending upon the amount of shipments.

Thus Mr. Page testifies as follows:

"Commissioner Prouty's arguments seem to be to the effect that the Standard Oil Company had advantages by reason of having its refineries and distributing plants at Chicago and the Atlantic seaboard, as well as that at Lima, Buffalo, and other middle State points, as compared with a refiner who had his works only at Cleveland or in the Pennsylvania oil regions. We admit that by having its refineries and distributing plants at Chicago for the West, at Buffalo, Lima, and Parkersburg for the middle States and the South, and at the Atlantic seaboard for the East and New England, we have decided advantages over a refiner who has his works only at one point, and who tries to compete with us in selling oil throughout the country. We claim, however, that such an advantage is a fair one, and can not be overcome by any fair or reasonable adjustment of freight rates. We further claim that by having our refineries and distributing points located at various points throughout the country we can and do distribute more cheaply and sell the oil at a less cost to the consumer, and it is more to the interests of the country at large for the consumer of oil to get it at a low cost than it is to try to fix freight rates on any basis that will permit one manufacturer at one point to distribute his products throughout the United States."

Mr. Page adds that the rates on oil from different points in the Pennsylvania fields are made on a uniform basis, and similarly from the Ohio field, so that there is no difference in favor of the Standard as regards places really similarly situated.

Mr. Lee and Mr. Monnett testify that independent shippers are especially benfited where water transportation can be secured in competition with rail transportation. The latter points out, for example, that the rates to New Orleans from Northern shipping points are lower than to places 150 miles north of there. Com-

pare on this subject the evidence as to differences in rates for short and long hauls.

2. Whiting rates.—Mr. Monnett testifies that the Standard Oil Company gets an advantage over its competitors by securing lower rates from points where it has refineries than are made from points where competing refineries exist. Thus it has transferred most of the business of its Cleveland branch to Whiting, Ind. The freight rate to New Orleans from there is 23 cents per barrel, as against 33 cents from Cleveland, and this injures severly the competing company of Scofield, Shurmer & Teagle.

Mr. Westgate states that formerly the rate on oil from Titusville to the Pacific Coast was 78½ cents per 100 pounds, but since the Standard Oil Company established its new refinery at Whiting, an added rate of 17½ cents to Chicago has been made, the rate from Chicago remaining 78½ cents.

As regards this difference in rates to the South, alleged to exist between shipments from Cleveland and those from Whiting, Mr. Page states that Whiting is considerably nearer to New Orleans than Cleveland. On its being pointed out that there is a greater difference between the respective rates in the case of petroleum products than in the case of linseed oil, Mr. Page states that railways adjust their rates from different points according to the amount of traffic and to other conditions. Chicago is naturally a large shipping point for linseed oil, and the traffic can bear a higher relative rate from there than it can from Cleveland. The Standard Oil Company has located its refinery at Whiting because it is nearer the great West, which is a large consumer of oil. The company thus has an advantage over those shipping to the West from more eastern points. It should be borne in mind that the Standard transports crude oil from Ohio fields to Whiting by means of pipe lines.

3. New York and New England.—Mr. Westgate states that he formerly shipped oil to various points in eastern New York and New England at the regular carload rate for Boston and so-called Boston points, but recently the through rates to numerous places have been withdrawn from this adjustment and local and arbitrary rates on oil, different from those on other commodities, added to the through rate. The Red Line rate to Boston from Buffalo is 23½ cents per hundred on oil, but to various other places in Massachusetts the rate has been made 33 cents. The witness is practically excluded from such cities as New Haven and Providence, and from Vermont points. A recent circular of the Red Line states that oils on the Central Vermont Railroad and the New York, New Haven and Hartford Railroad can not be taken at the rates named in the regular tariff, but are subject to arbitrary rates. The rate on oil to Burlington, Vt., in 1895, as quoted by the Lake Shore Railroad, was 44½ cents; to St. Johnsbury, Vt., 36½ cents; to Newport, Vt., 38½ cents per 100 pounds. The two last-named stations are entered in the Red Line traffic book as taking Boston rates, which are 23½ cents.

On April 12, 1899, the general agent of the Green Line system wrote to the witness that the Delaware & Hudson had orderd that on shipments from Whitehall, N. Y., to various points in New England and New York, named in the list, additions of from 5 cents to 14 cents per barrel must be made to the Boston rate of 23½ cents from Titusville. The agent called the attention of the railroad to the fact that these rates amounted to about 2½ cents per ton per mile, but no change was made, save to add certain other stations (between Saratoga and Northcreek), which should bear rates of from 6 to 18 cents in addition to the Boston rate.

The witness, in fact, has found that the railways do not appear to wish to handle independent oil. Very few agents solicit oil trade, as they do other kinds of freight business. The commercial agent of the New York, Chicago and St. Louis Railroad writes under date of April 12, 1898, that the road can not name satisfactory rates on oil from Titusville to Vermont. The manager of the New York Central Fast Freight Line (Red Line, White Line, Blue Line, etc. writes, December 5, 1898, that oil is not a commodity which they are allowed to handle on fast freight lines. The witness considers oil somewhat more dangerous to handle, but little more than other freight.

The difficulty as to railway rates on oil, in Mr. Westgate's opinion, appears to be largely that arbitrary rates are fixed in different places at the will of the railways, apparently with a view to favoring shipments by the Standard Oil Company. Rates are higher from places where the independent refiners do their manufacturing and shipping than from those where the Standard Oil Company is located. The witness believes that oil should be classified as sixth-class freight or, at any rate, as fifth class, and should bear the regular tariff rates prescribed for other goods of the same class.

Mr. Archbold disclaims all knowledge of recent changes in freight rates in New York or elsewhere, such as are referred to by Mr. Westgate. He doubts exceedingly whether any have occurred recently, nor does he know of any rates which work peculiar disadvantage to the competitors of the Standard Oil Company.

Regarding the statements of Mr. Westgate, Mr. Page testifies that the Standard makes East Boston a main distributing point for a large section of New England, shipping oil from there as far as to Portland on the north and by Newport on the south. This station is supplied partly by rail and partly by steamer shipments from the company's refineries at the seaboard near New York and Philadelphia. The Standard Oil Company also ships to some extent from the Pennsylvania oil region to New England, and in so doing pays precisely the same rate as others. It is not denied that by having refineries located on the seaboard the Standard has an advantage in supplying oil to New England over competitors having refineries in Cleveland, or in the oil region, but under no fair adjustment of rates could these more distant refineries be placed on an equality.

As to the reason of the railways for refusing to make a through rate on oil from the West to New England points, so that the rates to Newport and other places are much higher than to Boston, Mr. Page testifies

that the railways have their own methods of fixing through rates. In some cases they make through rates, while in others they charge local rates to different points in addition to the through rates to the central points. The witness particularly denies that Mr. William Rockefeller has ever influenced the rates on the New York and New Haven Railroad.

4. Advantage of Standard in shipments in and to Canada.—Mr. Gall, a wholesale dealer in petroleum products at Montreal, testifies that shortly after the Standard Oil Company in 1898 purchased all of the existing refineries in Canada, the through freight rates on oil over the Canadian Pacific and the Grand Trunk from American points to Montreal were nearly doubled, the purpose being, as he believes, to favor the Standard Oil Company in its business, since that company was refining oil in Canada and did not have to pay these high rates. The rate in April, 1898, from Warren, Pa., to Montreal was 23½ cents. At present it is 43½ cents, and this change has been due entirely to the increase in rates on the Canadian roads, the rate from Warren to Buffalo being still 8½ cents. The rate from Toledo was formerly 29½ cents, but it has been raised to 46½ cents per barrel. Owing to these increases in the freight it is impossible in Canada to sell at a profit even Ohio oil, which costs at Toledo only from 3 to 5 cents per gallon, at 17 cents per gallon, which is the price now fixed by the Standard Oil Company for Canadian oil, the latter being scarcely equal in quality to Ohio oil.

The company with which Mr. Gall is connected, together with the Sun Oil Refining Company of Hamilton, made complaint before the railroad committe of the privy council of Canada in June, 1899, concerning these excessive charges, and also concerning the discrimination which then existed on local shipments between Canadian oil and American oil.

At that time the railways were in the habit of demanding from shippers a statement whether oil was American or Canadian. In shipping from Montreal to St. Johns the witness has paid $1.08 per barrel on American oil and 54 cents on Canadian oil. The original bills of lading were submitted in evidence. This discrimination has been acknowledged by the railways, and has been stopped.

The rates referred to from Buffalo to Montreal, 35 cents per 100 pounds, are much higher than those from Sarnia to Montreal, on the same class of goods, although the distance from Sarnia is 77 miles greater. The Standard Oil Company has large refining works at Sarnia. The rate from Buffalo and Suspension Bridge to Montreal is 35 cents, and that from Sarnia to Montreal 25 cents per 100 pounds.

The witness also believes that secret rates are made to the Standard Oil Company on its shipments of American oil, much lower than the open rates. He has made this charge before the railway committee, but is unable to submit definite evidence in support of it as yet.

The witness believes that the increase of rates referred to was made at the instigation of the Standard Oil Company. For some time before the increase it was impossible for the independent shippers to ascertain what the proposed rates would be. The Standard Oil Company made very large shipments to Canada immediately before the higher rates went into effect. The witness believes that it had knowledge of the change that was to be made.

The Michigan Central Railway, as the witness has been informed by one of its officers, refused to increase freight rates when other roads did so, and the result is that the Standard Oil Company has taken away all its freight from the Michigan Central.

The Standard Oil Company is also shipping oil to Canada by vessel from New York, as well as transporting oil from Sarnia to Montreal by water.

The witness does not believe that this action of the railways is in any sense due to political influence, or to a desire to discriminate against the United States generally, although it has been the case in the past that Canada-owned railways, partly with the sanction of the government, have discriminated in various ways against the American shipper.

Mr. Westgate, an independent refiner at Titusville, testifies that when the rate on oil from Buffalo to Montreal was advanced from 23 cents to 35 cents per 100 pounds, he sought to obtain a rate on the New York Central to Adirondack Junction, nine miles from Montreal, with a view to having his oil switched the remaining distance. But the New York Central made its rate to that point 35 cents also. This would amount to 1.65 cents per ton per mile, while the average rate per ton per mile on oil is about 73 cents. The witness is thus practically shut out from the Montreal market.

As to freight rates to Canada, Mr. Archbold does not believe that there are any discriminations in favor of the Standard Oil Company. The advance in rates recently made on American oil from Buffalo to Detroit over the Canadian roads was in the interest of those roads and injurious to the Standard itself, since that company pays these rates in full and ships over 75 per cent of the American oil consumed in Canada. He knows of no rates that are not open to all comers.

Mr. Page confirms this statement, but adds that he does not know the proportion of the shipments by the Standard from this country as compared with the oil it manufactures in Canada, but does know that its shipments from the United States were greater last year after the advance in rates than before.

SHORT AND LONG HAUL.

Mr. Rice submitted statements concerning a large number of discriminations existing at the present time between rates to terminal points and to intermediate points, especially on the shipment of oil. These rates are taken from the public tariffs of the respective railways. All of them refer to shipments over Western and Southern railways. Among other discriminations mentioned are the following: Over the Union Pacific from Chicago to San Francisco the rate on oil is 78½ cents per 100 pounds, while the highest intermediate rate, to Humboldt, Nev., is $1.75, or a charge 122 per cent higher than for a haul 325 miles less. This difference applies to oil only, whereas on other commodities of the fifth class, in which oil belongs, the greatest difference between the charge for the full distance and the intermediate distance is only 12 per cent. From

St. Louis to Galveston, Texas, over the St. Louis, Iron Mountain and Southern Railway, the tariff rate on oil is 33½ cents, while the rate to Aldine, Texas, is 55 cents, or 64 per cent more for a haul 63 miles less. The greatest discrimination shown is over the Louisville & Nashville Railroad. From Louisville to Mobile the tariff rate is 18 cents per 100, while to Flomaton, an intermediate point, it is 56 cents, making 211 per cent higher charge for 61 miles less haul. Mr. Richardson declares that on the Southern roads there is no difference in the charge in favor of terminal as against intermediate points on other classes of commodities, but only on oil.

Mr. Rice testifies further that he proved in his suits that the Southwestern railways have allowed the Standard Oil combination stop-over privileges for its cars, billed to the terminal points, by which means part of the oil in a tank can be unloaded at the high-rate intermediate pints. According to a letter from the Inter-State Commerce Commission, dated July 12, 1897, this stop-over privilege was still allowed at that time.

RAILWAY RATES AND PIPE LINES.

Several witnesses declared that the Standard Oil combination still has a great advantage from the fact that it transports crude oil from the producing regions to its refineries on the seaboard and at Whiting, Ind., by means of pipe lines. The cost of transportation is believed by these witnesses not to exceed from 5 to 8 cents per barrel, while the public charge of the pipe lines for transportation is several times that amount, being about the same as the railway rates, which are believed to be fixed largely by agreements with the pipe line companies. For evidence as to the earlier arrangments with the railways, which the witnesses believe to exist still.

Mr. Davis states that he has sought to transport oil from wells controlled by him in the Corning field to Marietta, where he was interested in a refinery. The charge made by the pipe line company was 35 cents per barrel, and after long delay in securing a reply to his telegram the Toledo and Ohio Central Railroad made a rate of 35 or 36 cents per barrel, which was practically prohibitive.

UNDERBILLING OF CARS.

1. Generally.—It is charged by opponents of the Standard combination that it is favored in certain cases by having the weight of the contents of its tank cars underbilled. This charge is denied specifically with regard to Inter-state shipments by representatives of the Standard Oil Company, and the instances where such underbilling has occurred are explained as occasional errors. The evidence is not so clear as to underbilling of tank cars in shipments within the State.

Mr. Rice expressed the belief that there is a certain amount of underbilling of weight in the case of all tank-car shipments, owing to the fact that the weight per gallon is estimated at 6.4 pounds. The standard weight of illuminating oil is not less than 6.7 pounds, so that the underbilling is 4.68 per cent. Lubricating oils are billed at 6¾ pounds per gallon, but this is sometimes as much as 15 per cent less than the actual weight.

Mr. Page explains the reason for the adoption of the standard of 6.4 pounds per gallon. It applies to all petroleum products, including the lightest, such as gasoline. The different products range from 5¼ to 7½ pounds per gallon, but 6.4 pounds has been found by careful investigation to represent the actual average on the basis of the amounts shipped. This method of calculating an average weight for the contents of tank cars saves an immense amount of difficulty to shippers and railways. To actually weigh cars in each case, or to test the exact weight of the contents per gallon, would involve great effort.

2. New York case.—Mr. Westgate testifies that he has seen within the past three or four years freight receipts for oil billed from Olean, N. Y., at the rate of 24,000 pounds for cars containing 7,000 to 7,200 gallons. The weight of oil is 6.4 pounds per gallon, which would make the real weight of these cars 44,800 or 46,080 pounds. The Standard Oil Company prepays the freight, apparently with a view to concealing these underweights. The witness is of the opinion that every car shipped from the refineries is billed on this basis. In another instance he heard of a person who bought crude oil from the Standard and received freight bills at the rate of 24,000 pounds for cars containing 6,000 to 6,600 gallons, but who afterwards received a corrected bill at the actual weight. This underbilling was not an ordinary error. The witness himself is compelled to pay on the full weight, which makes his charges 50 to 100 per cent more.

Mr. Archbold absolutely denies that the Standard Oil Company has an arrangement with railways with reference to underbilling of tank cars, as charged by Mr. Westgate. He submitted to the Commission a book known as the "Tank Gauge Handbook.," giving the number and the full capacity of every car used. This book is in the hands of all railways, and is the basis for billing oil. The witness also submitted letters from the general freight agents of the Western New York and Pennsylvania Railway and the Erie Railroad, the only roads reaching Olean, N. Y., each denying positively that any arrangement for underbilling cars exists, and stating that on the contrary freight has been charged, and collected on the basis of the maximum number of barrels each tank could contain at an estimated weight, formerly 6.3 pounds per gallon, but later 6.4.

Mr. Page likewise testifies as to the impossibility of underbilling tank cars. The railways charge freight on the capacity of the tank car, no matter whether it is loaded to full capacity or not. The weight is estimated on the basis of 6.4 pounds per gallon, whatever be the actual weight per gallon of the contents.

3. New York, New Haven and Hartford case.—Mr. Rice refers to the evidence in a suit before the Inter-State Commerce Commission in 1897 to show that in that year two cars of naphtha, containing 100,986 pounds actual weight, shipped from East Boston to Newport, R. I., were charged at a weight of 48,000 pounds by the New York, New Haven and Hartford Railroad, in which Mr. William Rockefeller is a director. He states that Mr. Page explained that this was

due to a clerical error and paid the balance due, but Mr. Rice believes that a similar discrimination has existed in regard to all shipments, this single case only having accidentally come to light.

Mr. Page takes up this case in detail. He submitted a letter from Mr. Hall, the vice president of the New York, New Haven and Hartford Railroad, to the Inter-State Commerce Commission, stating all shipments made over that road from East Boston to Newport from April 6, 1896, to December 6, 1897. On three separate occasions two or three cars were received by that company from the Boston & Albany Railway billed at a weight of 24,000 pounds each. The weight thus given was accepted through the error of the agent of the New Haven road, and without any misrepresentation on the part of the shipper. The errors were subsequently discoverd, and the difference in freight collected.

Mr. Page explains the reason for the billing of the oil at 24,000 pounds by the Boston and Albany as follows: "Our works are located at East Boston on the Boston and Albany road. The Boston and Albany road have to switch any car from Boston to East Boston, where the cars are delivered to the New Haven road. That switching charge, as I recall it, is $6 per car; either $4 or $6 per car. The Boston and Albany road, like many other roads, wishes to show its tonnage, whether the rates are per car or per 100 pounds; and where the rate is per car, as in this instance, it probably uses 24,000 pounds, which is the usual carload weight; it is the minimum carload weight. They simply put in 24,000 pounds. The testimony shows, and I swear now, that we did not give the Boston and Albany road 24,000 pounds as the weight of those cars, nor did we give them any weight. We did notify, not only directly, but through this book, the actual weight of all those cars, and it was simply an error of the New Haven road, as shown in the testimony, and as offered by Vice President Hall, that the New Haven road took in error the constructive weight of the Boston and Albany in their bill, instead of taking the actual weight, which they had in their power to get, and should have got."

As to whether it was the general custom of the Boston and Albany to bill cars at this minimum rate of 24,000 pounds to other stations, Mr. Page declares that he does not know. If this be the case, the Standard nevertheless pays the same rate as all other shippers.

Mr. Page also submitted extracts from the testimony before the Inter-State Commerce Commission in its investigation of these cases, and further extracts are quoted in a footnote. Mr. Kidder, agent of the Boston and Albany Railroad, at East Boston, stated that the receipts furnished by the Standard Oil Company regularly contained no statement as to weights, and that it was the ordinary custom to ship tank cars of naphtha at the minimum weight of 24,000 pounds to all local points. The witness had never before seen a copy of the "Tank Gauge Handbook," containing the capacity of tank cars.

Mr. Keyes and Mr. Davis, employees in the freight department of the New York, New Haven and Hartford road at Boston, testified that they had no copy of the "Tank Gauge Handbook" in their office. It was the custom to bill tank cars at the weight named in the waybill of the Boston and Albany unless instructions to the contrary were received. Such instructions were, however, sent by letter from the Standard Oil Company in almost every case, stating the weight of the oil.

Mr. Winlock, assistant general freight agent of the New Haven road, testified before the Inter-State Commerce Commission, confirming the statements of Mr. Keyes and Mr. Davis. He submitted a letter from the Standard Oil Company, dated February 9, 1897, stating the actual weight of two cars, which had been billed by the railroad at 24,000 pounds, this letter having been overlooked by the clerks in the office. Mr. Winlock further stated that the agents of the road billed tank cars at their actual weight in the case of inter-state shipments, but was not prepared to answer the question as to whether a different rule was followed for shipments within the State. It is not clear whether the inability to answer is due to ignorance or unwillingness. Mr. Winlock specifically denied, however, that there was any understanding with the Standard Oil Company by which cars were billed within the State at less than actual weight. Extracts from this testimony before the Inter-State Commerce Commission follow:

"Q. You are the man who would know about that rule, if there was any? A. I have already said I think it is the same. I am not absolutely positive of the different rates which apply on inter-state business.

"Q. I am not talking about rates; I am talking about a rule as to the billing of these cars, and my question is this: When you bill a tank car to an inter-state point —a point without the State of Massachusetts—do you bill it at its actual weight; and when you bill a car to a point in the State of Massachusetts do you bill it at a weight of 24,000 pounds? A. That is a question that I could not answer.

"Q. Do you mean to say that you have no knowledge about it? A. No, sir.

"Q. You mean you don't want to answer that question? A. I mean I don't want to answer that question.

"Q. (By Mr. Page) You have no understanding with the Standard Oil Company, or any instructions from your superiors, by which you are to bill cars within the State at less than the actual rate? A. None whatever.

"The Commissioner. Not the actual rate?

"Q. At less than the actual weight. You have no understanding with us by which you should bill cars at 24,000 pounds within the State because of our inter-state shipments, have you, or for any reason? A. We have no instructions from you——

"Q. Or understanding with us? A. We have no understanding with you at all, Mr. Page, of any kind.

* * * * * * * * *

"Q. In other words, Mr. Winlock, the rates that you may name us within the State have no connection or no bearing in regard to inter-state business? A. None whatever.

TANK AND BARREL SHIPMENTS.

Much testimony was presented to show that great advantages had been formerly given to shippers of oil

in tank cars, as compared with those using barrels, and that some differences in this regard still exist. It is admitted by some that all tank-car shippers enjoy equal advantages, but it is urged that the Standard Oil Company controls most of the tank cars.

1. Early difference in rates per hundredweight.—Prior to 1888 it was customary, if not universal, that lower rates per 100 pounds should be charged for freight on oil in tanks than in barrels.

Mr. Rice believes that the higher rates on oil in barrels which formerly existed were made at the instance of the Standard Oil Company, and not because of any preference of the railroads for tank-car shipments. Up to 1888, he states, the Pennsylvania Railroad carried oil in barrels, including the package, for the same rate per gallon as in tank cars, but afterwards changed so as to require the shipper to pay for the weight of the package.

Mr. Rice further declares that he has proved gross discriminations, exclusively in favor of the Standard Oil Trust, by the Southwestern railroads since the adoption of the Inter-State Commerce Act. Although he does not make this point clear, many of these discriminations were apparently between tank-car shipments and barrel shipments, and no specific evidence is submitted to show that the tank-car rates made to the Standard Oil Company were not open to the general public. Mr. Rice submitted tables showing the difference in mills per gallon charged to the Standard Oil Trust and to himself for shipments over the Louisville and Nashville Railroad from Louisville and Cincinnati to various southern points. The percentage of difference between these rates ranges from 66 2-3 to 333 per cent. Similar tables as to the rates over the Cincinnati, New Orleans and Texas Pacific, Newport News and Mississippi Valley, and St. Louis and Iron Mountain roads show differences ranging from 40 to 267 per cent. These differences were proved to exist up to April 1, 1888, and depite an order of the Inter-State Commerce Commission, the Missouri Pacific Railroad was still carrying tank cars by lump sum on May 28, 1888.

Mr. Rice states that he proved that in November, 1887, seven or eight months after the Inter-State Commerce Act took effect, he was paying on barrel shipments of oil from Cincinnati to Birmingham, Ala., four times as much freight as the Standard Oil Company was paying on tank-car shipments. He was paying 59 cents per 100 pounds on 400 pounds to the barrel, amounting to $2.36; while the Standard only paid 16.8 cents per 100 on 315 pounds, amounting to 52.9 cents per barrel. The discrimination was 346 per cent.

Mr. Page admits the difference which existed, after the passage of the Inter-State Commerce Act, between the rates on oil in tank cars and in barrels. This was not a discrimination between individuals, since rates in each case were published and open to all. The Inter-State Commerce Commission, in 1888, ordered that the rates per 100 pounds on oil in tank cars and in barrels should be the same, the weight of the barrels being included in the weight charged upon. The railroads accordingly adjusted their tariffs in this way, and they still remain on that basis. The Standard Oil Company was at that time, as the witness believes, shipping more oil in barrels than in tank cars, so that it was injured as much as its competitors.

This decision of the Inter-State Commerce Commission in 1888 is also referred to incidentally by other witnesses.

2. Charge for weight of barrel.—Two or three witnesses opposed to the Standard combination refer to the fact that discriminations in favor of the Standard have been proved, since 1888, before the Inter-State Commerce Commission, which has ordered damages to be paid to the shippers injured. It appears from the evidence of these same witnesses, however, and still more clearly from the evidence of Mr. Archbold and Mr. Page, that the case referred to is one of difference in charges between tank shipments and barrel shipments.

The railways complied generally with the order of the Inter-State Commerce Commission of 1888, above referred to. Later on, the independent refiners of Pennsylvania secured an order from the commission that the weight of barrels should be disregarded in charging for shipments of oil. The railways have not complied with this order or paid the damages assessd on account of the charge made for the weight of barrels.

Mr. Page explains precisely the status of the suits before the Inter-State Commerce Commission as to barrel shipments. Several years ago the commission made an additional decision that the weight of the barrels must not be included, but should be carried by the railroad free. This order the railroads refused to obey, and they also refused to pay the damages which were assessed by the commission later on account of the charge made for the weight of the barrels. The case is now pending before the United States Court in Pittsburg.

Mr. Page adds that a large proportion of the oil shipped by the Standard Oil Company is transferred from tank cars to barrels at distributing stations and shipped in that way to local points, so that the Standard is subject to these charges upon the weight of the barrels, the same as other shippers.

Mr. Page and Mr. Archbold further testified that the Standard Oil Company itself will have a large claim for repayment by the railways of the freight paid upon barrels, if the above decision is sustained by the courts. Mr. Archbold, however, declares that he considers the requirement that barrels be carried free to be unjust.

Mr. Rice brought in 1889 complaits before the Inter-State Commerce Commission concerning the Southwestern railroads, raising questions as to the like classification of barrel and tank oils, the charge for the weight of the package, the return of tank cars free, and the existence of lower rates on cottonseed oil in tank cars than on petroleum, the latter, which were proved to exist, constituting an advantage to the owners of tank cars. These cases were never decided, being "held open for additional evidence."

3. Relative advantages of tank cars and barrels.—There was disagreement among the witnesses as to the question whether a relatively lower charge for oil in tank cars than for oil in barrels is justifiable. The

relative advantages to the railways of the different methods of shipment were discussed.

Mr. Page declares, in the first place, that it is entirely fair at least to charge for the weight of the barrel, because it is itself a merchantable article and its value is added to the price of the oil sold, while the same is not true of the tank car.

It was pointed out by the opponents of the combination that tank cars are returned free of charge, while barrels are not. Tank cars must be returned empty, while the box cars used for barrels can contain a return cargo. To this Mr. Page replies that box cars used for oil can seldom be employed for other purposes, so that these also are usually returned empty, and free of charge.

Mr. Page testifies further that tank-car shipments are more economical generally to the railways. The average capacity of the tank car is 140 barrels, whereas it is seldom possible to carry more than 60 barrels in a box car. The tank car is universally loaded by the shipper and unloaded by the consignee, while the box car is very often unloaded by the railroad in its own depot.

Mr. Rice denies that it is an advantage to the railways to handle oil in tank cars. He quotes the evidence of John S. Wilson, general freight agent of the Pennsylvania Railroad, before the Inter-State Commerce Commission in 1888. Mr. Wilson stated that oil in tank cars was exceedingly dangerous; that in case of collision or other accident the oil would catch fire and flow to great distances, while, on the other hand, the separate barrels can often be saved; and that the necessity of returning tank cars empty made them less economical than box cars for barrel shipments. Mr. Rice admits, however, that a tank car carries more oil than a box car, and saves the weight of barrels; but he believes that there is no advantage to the railways in the loading and unloading of tank cars, since barrels also are loaded and unloaded by the owners of the oil, not by the railways.

On his point Mr. Westgate testifies that Mr. Motheral, a confidential officer of the Green Line in Oil City, stated in 1888, before the Inter-State Commerce Commission, that for five years the loss on oil shipped in barrels had been twenty-seven thousandths of 1 per cent., while the loss in tanks was forty-three thousandths of 1 per cent. The risk on oil is somewhat greater than on ordinary freight, but the witness believes that it should be classified as sixth class, or at least fifth class freight.

4. Mileage on tank cars.—Mr. Rice declares that the 8,000 tank cars owned by the Standard Oil combination are paid for every three years by the mileage of three-fourths of a cent per mile each way, which is paid by the railways for the use of these cars. He admits that the same mileage is paid to other owners of tank cars, but states that the Standard has most of these cars. Box cars can be used to bring back other freight, but the railway pays for hauling the empty tank cars.

Mr. Page denies that the payment of three-fourths of a cent per mile by the railways to the Union Tank Line Company for the use of its tank cars is excessive, and also that the Tank Line Company is making extraordinary profits. The company receives no other payment whatever for the use of its cars than this mileage rate. It receives no commission from the Standard Oil Company, and has no other sources of profit. Owing to the fact that the consumption of petroleum in the summer is small, a large part of the equipment of the company is earning nothing whatever during a considerable portion of the year. Moreover, the rate paid to this company by the railways is the same as is paid by the owners of other tank cars, of whom there are 170 or 180, holding an aggregate of 7,420 cars, as compared with the 5,851 owned by the Union Tank Line Company. As a matter of fact, since its formation, in 1891, the Union Tank Line Company has never paid a dividend, and the actual earnings have been only 4.5 per cent. per annum on the investment. The company does not pay excessive salaries; hence this is not an explanation of its low profits. The business is continued because it is a necessary arm of the petroleum industry. The present owners of the Union Tank Line Company and of the Standard Oil Company are the same, and the Standard continues the business because it is the most economical way to handle oil. Probably the reason why the two corporations are kept separate is that the Union Tank Line Company is in a better position to run cars than the Standard Oil Company would be, since the latter is also doing a manufacturing and marketing business.

5. Indirect advantages to tank shippers.—In addition to lower rates, it is claimed that the Standard combination receives minor indirect privileges and advantages on its tank car shipments.

Thus Mr. Monnett states that the Union Tank Line Company receives an allowance from the railways for loading and unloading its own shipments, while the rates for shipments are very much lower in tanks or carload lots than in part carloads. This latter difference the railways justify on the ground that shipment of oil and gasoline contaminates other goods in the cars.

Mr. Rice also complains of the injustice of the difference between the charge for oil in tank cars and that for oil in less than car lots.

Mr. Archbold denies absolutely Mr. Monnett's statement that discriminations are made in favor of the Union Tank Line Company or the Standard Oil Company. "The rates fixed by the railroads in connection with tank car lots and single barrel or part car lots have been the same to all, and carried with them no discrimination whatever in favor of the Standard Oil Company."

Mr. Rice further declares that up to March 15, 1890, the railways allowing a deduction of 62 gallons from the actual contents of each tank car, amounting to 1¼ per cent of the shipments. From March 15, 1890, to September 1, 1892, this deduction was 42 gallons. Mr. Rice considers that there was no justification for this deduction.

Mr. Page explains the practice of allowing "outage" on tank car shipments. It was found by actual experience that there was an average loss of weight through leakage and otherwise, of about that amount during the transportation of a tank car of oil. It was not just that the shippers should pay freight on oil which was not actually delivered. The outage is allowed to all shippers, and constitutes no discrimination.

Mr. Rice declares that the Southwestern railways do an injustice by the rule that tanks containing petroleum, which are intended to be used for permanent oil stations, shall be transported at actual weight at the oil rate. The railway become the judge as to whether the tank car is intended for that purpose.

Mr. Page replies that this practice seems to be perfectly just, and if the railroads wished to discriminate in favor of the Standard Oil Company they would carry the tank free, as they do the regular tank car.

Mr. Rice testifies that the Central Freight Association also provides that tank cars will be received only when consigned to points where proper unloading and storage facilities exist. The railway is the judge as to the character of such facilities.

A further advantage was given in 1891 by the Southern Pacific Company in favor of shipments in a peculiar box tank car combination, exclusively owned by the Standard Oil Company under patent.

Mr. Page declares that the first rule above mentioned means simply that the railways will not allow a tank car to be unloaded in their depots or yards by improper methods, which might result in leakage or accident. The box tank cars referred to contain a space between the tanks which can be used for other loads. The transcontinental railroads charge for returning ordinary tank cars, but not for these, because they can be so used.

6. Furnishing of tank cars by railways.—Mr. Rice testifies that it is practically impossible for independent shippers of petroleum to secure tank cars from railways If they use such cars they have to furnish them themselves at a very considerable expense. The Standard Oil Company, at an early day, bought up all the tank cars from the railways, as the witness believes, with the understanding that the railroads should not build other cars. The witness has himself supplied some tank cars, but refers especially to the attempt on his part to secure certain cars from the Milton Car Works in 1887 on the installment plan of payment. This method, he declares, is the customary manner of paying for cars, but credit in this case was refused on the ground that the financial supporters of the car company had been unwilling to advance the money for the construction of the cars on account of some supposed controversy which they claimed to exist between the Standard Oil Company and the railroads on the one hand and Mr. Rice on the other.

Mr. Rice believes that all railways should own tank cars, and furnish them to the shippers in the same manner as other cars.

Mr. Page expresses the opinion that it would be a burden upon the railroads to require them to furnish tank cars to the shippers. The tank car is a special car for a special purpose, similar to the special cars used for numerous other kinds of shipments. The ownership of the tank cars would not insure the railroads the transportation of oil, and if every road had a sufficient number of tank cars to handle all the business which sometimes passes over its lines, it would have to own many more than would ordinarily be employed.

INDIRECT ADVANTAGES OF STANDARD.

1. Changes in rates for Advantage of Standard Oil Combination—Mr. Rice submitted an extract from the Paint, Oil and Drug Trade Review of January 25, 1893, containing a large number of telegrams and letters, written in November and December, 1888, between officers of the Southern Pacific Railroad and of the Transcontinental Association, on the one hand, and officers of the Standard Oil Company at New York and San Francisco, on the other.

The transcontinental freight rate was then 82½ cents. The railways proposed an increase. The officers of the Standard Oil Company desired to secure the continuance of low rates for the time being, until that company should be able to stock up on the Pacific coast, and that the rate should then be raised to $1.25, with the arrangement that it should be again reduced, and thereafter changed from time to time, without public notice in advance, at the dictation of the Standard Oil Company. There was considerable correspondence as to the amount of this lower rate which was to be maintained temporarily for the advantage of the Standard Oil Company, but it was finally fixed at 90 cents. The following extracts from the correspondence show that the railway companies made the agreement to shift the rates at the instance of the Standard Oil Company:

San Francisco, November 14, 1888.

W. Sproule, San Francisco:

Say to Tilford that association will probably consent to following agreement: Oil rate from Cleveland to be $1; at this rate he can stock up; after doing so he to notify Chairman Leeds, who, after giving necessary notice, will advance rate to $1.25, and continue that rate until such time as Tilford notifies him of reduced stock, when he will again reduce it to $1 to enable him to stock up.

J. C. Stubbs.

Personal.] Standard Oil Company,
San Francisco, December 4, 1888.

W. H. Tilford, Esq.,
Vice President Standard Oil Company,
26 Broadway, New York.

Dear Sir:—I will telegraph you this afternoon as per translated copy of message herewith attached, which is self-explanatory.

I herewith hand you a copy of a letter I have just received from Mr. Sproule, assistant general freight agent of the Southern Pacific Company, this city. This letter I interpret to mean the 90-cent rate is for us to stock up from time to time, and that the $1.25 per 100 rate will be in effect whenever we may desire. This $1.25 rate is what Mr. Sproule refers to in the latter portion of his letter, as my offer of 90 cents to Mr. Stubbs was on condition that he has the rate of $1.25 put in effect when we might ask him. This letter also reads as if the 90-cent rate

and the $1 rate was to be put in effect January 1. No doubt Mr. Stubbs was unaware that we were stocked up at the present rate of 82½.

The Transcontinental Association adjourned at Chicago yesterday, and I understand that Mr. Stubbs is now on his way home. I will see him on his arrival here, and if Chairman Leeds, of the Transcontinental Association, has been notified to put the 90-cent rate in effect January 1 I will have the same corrected by wire and the $1.25 rate put in. As soon as Mr. Stubbs reaches home I will telegraph you whether it is intended that the 90-cent rate should be put in effect January 1 or the $1.25.

Yours truly, E. A. Tilford.

San Francisco, December 6, 1888.

J. C. Stubbs, Chicago:

If it is not already agreed upon that the $1.25 rate is to go into effect January 1, on petroleum and its products from Cleveland and Pittsburg to the Pacific coast, will you kindly telegraph Chairman Leeds to put this rate in effect on the day mentioned. Please answer. E. A. Tilford.

Personal.] Southern Pacific Company,
Office of General Freight Agent,
San Francisco, December 8, 1888.

Mr. E. A. Tilford,

President Standard Oil Company, City.

Dear Sir:—I beg to inform you that I am in receipt of advice that on January 1 the rate on petroleum oil and its products will be to $1.25 per 100 pounds on carload shipments from agreed eastern points.

Yours truly, Wm. Sproule.

Mr. Sproule was assistant general freight agent of the Southern Pacific Company, Mr. Stubbs was general traffic agent of that company, and Messrs. W. H. Tilford and E. A. Tilford were officers of the Standard Oil Company.

Another letter shows that the Standard Oil Company had already, before the increase to $1.25, on January 1, took place, secured a stock sufficient to last for four months.

Mr. Rice explains that these telegrams and letters were secured through an employe, either of one of the railways or of the Standard Oil Company, who had been discharged.

Mr. Page, on behalf of the Standard Oil Company, testifies that he knows nothing about the above correspondence, but that at least since March 2, 1891, the rates on oil from eastern points to California have been absolutely unchanged.

2. Exclusive Shipment of Standard's Oil—Mr. Emery declares that it is still the practice of the Standard Oil Company to seek arrangements with railway companies by which they shall handle oil exclusively for the Standard, threatening that otherwise it will be forced to cut prices to meet competition to such a degree as to be unable to pay reasonable railway rates. It also seeks to make arrangements between competing roads for a division of the traffic, and for the exclusion of independent shippers. On account of such discriminations, and of the special cuts made by the Standard Oil Company in the markets sought by its competitors, Mr. Emery has found it impossible to ship oil to any considerable number of places in the United States, 70 per cent. of his product going to Europe. The witness asserts that he could compete fairly with the Standard Oil Company if he could secure equal railroad rates.

3. Control of Terminal Facilities—Mr. Rice declares on the basis of testimony of officials of the Standard Oil Company, and of the railways, that the combination owns all terminal facilities for handling oil on four of the trunk lines from the oil regions to the seaboard.

Mr Lockwood also states that the railways during the 70's turned over the terminal facilities at New York to the Standard Oil Company, so that the independent refiners could not use tanks, but were forced to ship in barrels.

4. Purchase of Oil by Railways—Mr. Lee believes, without positive knowledge, that while the Standard receives no direct rebates from railways, it is paid double prices for lubricating oils used by the roads, this constituting a form of discrimination in its favor. None of the leading railways buy lubricating oil of the independents.

Mr. Rice also declares his belief, based on hearsay, however, that the Standard Oil Company receives excessive prices for its lubricating oils sold to the railways. He quotes from the advertisement of the Galena Oil Company, a branch of the Standard Company, in which it is stated that Galena oils are used on nineteen-twentieths of the total railway mileage of America.

Mr. Davis states that the refinery in which he was interested formerly supplied some lubricating oil to the Baltimore & Ohio Southwestern Railroad. The directors of that road bought stock in the Argan Refining Company. The witness's refinery has since found it impossible to sell oil to the railroad, no matter how much the price might be cut, although he has no direct knowledge that it prefers Argan refinery. The railroad has considerable influence on dealers along its line, who can often get oil from it in small quantities.

Mr. Clark states that while he was agent of the Standard Oil Company at Newark, O., he furnished from 60 to 150 barrels of refined oil per month to the Baltimore & Ohio Railroad. The bills for the quantity were made out and sent to Columbus to have the prices fixed. The witness was allowed to have no direct dealings with the railway companies as to freights, handling of cars, etc. He did not sell lubricating oil to railroads.

Mr. Page denies that the Standard Oil Company is favored by railways in the purchase of lubricating oil. The Galena Oil Company is specially engaged in the manufacture of lubricating oil for railway purposes, and owing to the superior and uniform

quality of its oils they are used on a large proportion of the railways. The company guarantees to the railways that the cost of lubrication per train mile, for a certain period of time, shall not exceed the cost of oils previously used; usually, in fact, it guarantees a reduction. The actual prices per gallon are higher than those of some low grades of oil, but as measured by lubricating power they are lower. The price is made the same to all railways, regardless of quantity, although the form of guaranty varies. Oil is usually sold to the railways under contracts for three or five years, and these contracts are naturally made by the central officer and not by purchasing agents of local divisions.

The Galena Oil Company does not sell largely to manufacturers or others than railways. So far as it does so it makes them the same price, but its oils are less fitted for that purpose.

The Galena Oil Company has increased its business tenfold since the Inter-State Commerce act went into effect, which indicates that it did not secure its control of the railway business in connection with any system or rebates existing prior to that time. Independent producers still furnish considerable oil to railways.

5. Excessive Rates on Oil Well Supplies—Mr. Lockwood submitted a receipted freight bill showing the charges on a carload shipment of oil well supplies for a distance of 49 miles in Pennsylvania to be 5.95 cents per ton per mile. He has paid on shipments of one and two tons 13.57 cents per ton per mile. Statistics show that the average cost of moving freight in this country is 0.85 cent per mile. He is not aware that these rates were higher than those paid by other shippers.

RELATION OF THE PRESS TO THE COMBINATION.

SUBSIDIZING OF OHIO PAPERS.

According to Mr. Monnett, the Standard Oil Company of Ohio has organized what is known as the Jennings Publishing Advertising Agency, which distributes advertising for the company in various newspapers and makes contracts with them by which certain material defending the Standard Oil Company is published as news and editorial matter, but duly paid for. The company also purchases large numbers of newspapers containing such notices, thereby practically buying the support of the press. The following is a copy of part of a contract submitted in evidence in the Ohio suits against the Standard: "The publisher agrees to reprint, on news or editorial pages of said newspaper, such notices set in the body type of said paper and bearing no marks to indicate advertising as are furnished from time to time by said Jennings Agency, at the rate of —— per line, and to furnish such agency extra copies of paper containing such notices at four cents per copy." The witness also exhibits an extract from the Lima Times-Democrat, which was published under such a contract.

PITTSBURG PAPERS.

Mr. Boyle testifies that none of the newspapers of Pittsburg give the same courtesy to the Standard Oil Company as to other interests, The Standard has at various times been viciously attacked by persons associated with the Producers' Protective Association, and has had to pay the newspapers advertising rates to secure the insertion of replies to the most outrageous lies. In the Derrick, which Mr. Boyle manages, both parties have been treated alike.

OIL CITY DERRICK.

Mr. Lockwood maintains that the Standard Oil Company has bought the Oil City Derrick and has hired a man (Mr. Boyle) to run it, but his assertion appears to be based primarily on the nature of the material published in the paper, which is bitterly opposed to independent movements. The paper has been sued by Senator Lee and Senator Emery for libel. The Titusville Herald and the Pittsburg papers seem also to be under the control of the Standard Company, and publish what is furnished by it.

Mr. Boyle, proprietor and publisher of the Oil City Derrick, testifies that the Standard Oil Company is not now and has not been for many years interested in that paper. The witness owns all the stock except four shares held to qualify the other directors. The paper is not, as is often assumed, an organ of the Standard Oil Company, but of the oil producers generally. Within the last 10 years there has been no occasion for adverse criticism of the Standard Oil Company, but there would have been such criticism if it had been called for. The paper is not opposed to all independent movements, but only to those involving unnecessary outlay of money and consequent taxation of producers. The duplication of a pipe line is, in the opinion of the witness, such an unnecessary outlay, as is shown by the fact that pipe lines established within the last 10 years have never paid dividends. The witness insists that he does not appear before the commission at the solicitation of the Standard Oil Company.

Mr. Boyle testifies further that fully half a dozen libel suits have been brought against him as editor of the Derrick, all by officers and members of the Producers' Protective Association. In two cases conviction was obtained, in two there was confession of judgment, and in one a failure to convict. These suits were all taken into another county where the people and the courts were prejudiced in favor of the Producers' Association. Mr. Boyle protests bitterly against the unfairness of the various trials.

STANDARD OIL COMBINATIONS.

Note.—About the year 1872 leading refiners of oil began to combine for the purpose of making the business more profitable. The combination was by means of purchase of stocks and interests of various com-

panies, and until 1882 the combination was solely by stock ownership in the hands of a limited number of individuals, who controlled the corporations as agencies in a common business. In 1882 these owners entered into the trust agreement. The companies whose stocks they owned in whole or in part were not then competing companies. The individuals named as trustees had controlled them by virtue of absolute ownership of a majority of their stocks. Under the trust the stocks were placed by their owners in the hands of the trustees who exercised all the powers of the owners. In exchange for the stocks the trust issued trust certificates, and the profits were divided on these. When the trust was dissolved in 1892, the same conditions existed as before the trust was formed. The individuals, then trustees, continued to control the companies by virtue of absolute ownership of a majority of their stocks; consequently the corporations named have been, many of them since 1872, separate agencies carrying on business as a unit for the individuals, who are their common stockholders. In June, 1899, a new corporation was organized in New Jersey, with a capital of $110,000,000, to combine into a single, more compact organization, the separate companies which had been of late years controlled through ownership of a majority of their stocks by the few individuals who had formerly been trustees of the Standard Oil Trust. This new company is intended to unite again in compact form all of the separate companies which have been *working* together ever since the formation of the trust.

WASHINGTON, May 11, 1899.

TESTIMONY OF MR. JAMES W. LEE.

Former State Senator of the State of Pennsylvania.

The commission met at 11 a. m., May 11, 1899. Vice-Chairman Phillips presided, and introduced Mr. James W. Lee, who testified in regard to trusts.

PERSONAL HISTORY—THE INDEPENDENT OIL COMPANIES

Q. (By Mr. Phillips). Will you give your name, place of residence and business? A. James W. Lee. I reside at Pittsburg, Pa. I am at present engaged in practicing law. I am also connected with the independent pipe lines and independent oil companies. There are four companies. I am president of three of them and attorney for the fourth.

Q. Will you please name these companies? A. The first company to be organized was the Producers' Oil Company, Limited, with its general office at Warren, Pa. The second to be organized was the Producers and Refiners' Oil Company, Limited, with its general office at Titusville, Pa. The third was the United States Pipe Line Company, which is organized exclusively for the transportation of oil, both refined and crude, by means of pipe lines. One terminus of its pipe line is at Oil City; the other is intended to be finally at New York. The fourth company is the Pure Oil Company, which has the right to engage in the production, transportation, manufacture and marketing of oil and its products. That company was organized three years ago last November, and was the last to be organized. All four are owned by substantially the same persons, and operated together.

Q. Where were you admitted to the bar. A. I was admitted to the bar in 1869, at Franklin, Venango county, Pa., which is one of the original oil counties.

Q. Did you practice law in Franklin after being admitted there? A. I practiced law in Franklin until five years ago, when I removed to Pittsburg.

Q. Who was your partner in the law business there? A. My first partner was Mr. S. C. T. Dodd, now of the Standard Oil Company of New York. I was afterwards in partnership with Mr. George S. Criswell, now judge of the county, and Mr. Hastings.

Q. Have you ever held any public office? A. Only two. I was mayor of the city in 1875, and served two terms of four years each, in the State Senate of Pennsylvania, beginning in 1879.

EARLY HISTORY OF THE OIL BUSINESS.

Q. Had there been any attempts at legislation in regard to free pipe lines, or unjust discrimination, before you were elected, and had you any part in such legislation while in the senate? A. If you will permit me, probably it would be interesting to the commission to have a very brief statement as to the beginning and growth of the oil business, especially that branch of it that relates to transportation.

Q. We should be pleased to hear you. A. The first oil was discovered, as is generally known, by Col. E. L. Drake, who drilled for it in 1859, and ever since——

Q. (Interrupting) On Oil Creek? A. On Oil Creek, which is a tributary of the Allegheny river. The first well was probably about 18 miles distant from the river. Then oil was developed along Oil Creek to the south. A production of 200,000 barrels was reached in 1861 and 1862. The means of getting it to market at that period was by loading it into bulk boats on Oil Creek, building temporary dams and cutting them, thus producing an artificial flood, and running the boats out on the flood into the river, and then by the river to Pittsburg ,where the refineries were.

THE FIRST PIPE LINES.

The first pipe line, I think, was constructed in 1865 or 1866. It ran from Pithole, on the left of Oil Creek, down Oil Creek about five miles to the Allegheny river. It was built to carry the oil to the river; there it was loaded into boats and so conveyed to market. From that time the business of transporting oil by means of pipe lines increased. The oil wells spread first north to Tidioute, in Warren county, then south into Clarion county, then into Armstrong and Butler, and finally into Allegheny county, N. Y. By about 1880 they spread over a region some 300 miles long and 40 miles wide. As the field extended it became necessary to employ pipe lines. They were first built extensively in 1871 and 1872. The capital was very small at first. The company, which is now the National Transit, was started under another name, with a capital of about $4,000; and it grew very rapidly until the capital

reached millions. By 1877 the number of barrels that it transported reached about 15,000,000 a year, I think. I may not be entirely accurate in these figures, but it was a very large amount. Other pipe lines were started, but the united pipe lines soon came into control of the people who are now known as the Standard Oil Company—the Standard Oil trust. Small lines were built in various parts of the oil field, to convey the oil to the railroads. There were no lines leading to the seaboard till 1883.

THE RAILROADS AND THE STANDARD OPPOSE THROUGH PIPE LINES—LEGAL OBSTACLES.

A pipe line law had been passed, which limited the laying of pipe lines to certain counties. Efforts were made, from 1870 on, to obtain a general state law, which should allow the laying of pipe lines and give the right of eminent domain to companies organized for that purpose. That was opposed by the railroads, and also by the Standard Oil Company when it came into existence. That bill was introduced in successive legislatures, beginning with 1870. It failed each year until 1883, when it was finally passed. I was present in the legislature in 1879 when the bill failed, and again in 1881 when it failed. In 1883 it was passed only by agitation. The people who were interested in having it passed—the oil people—held mass meetings through the agricultural counties of eastern Pennsylvania, and got the farmers to send petitions to their own representatives to vote for the bill. Then it passed the House by a meagre majority.

Q. Were you present in that Legislature? A. I was present in that Legislature and attended a number of mass meetings that were held. I remember at one mass meeting small handbills were circulated through the audience saying that if this bill became a law their orchards would be destroyed, their springs would be polluted, and death would lurk under their doorsills. Of course that was a very effective way of frightening people who were not at all acquainted with that means of transportation. But it is a good deal safer and a great deal more economical than any other method of transportation. I do not think that there has been a single life lost in transporting oil by means of pipe lines in twenty years; and there were a great many lives lost in transporting it by railroad prior to that time.

RELATIONS OF THE STANDARD OIL TRUST TO THE RAILROADS.

Q. (By Mr. North) Were those the real objections to the passage of the bill? A. No; the real objections were that it would give to people who desired to enter the business the opportunity of doing so. The real objection was that it would interfere with the Standard Oil Company's exclusive right to operate these lines, and their power to secure unfair advantages over all competitors by combinations with the railroads. If any proof on that subject is desired, I would like to submit it right now. I have heard the statement made under oath. Mr. A. J. Cassatt, who was the vice president of the Pennsylvania Railroad in his testimony given before the master in a case that was instituted in Pittsburg in the Supreme Court of Pennsylvania, gave his testimony in regard to that subject. (Reading). Q. Did you understand at that time that these railroad companies and the United Pipe Lines had united with the Standard Oil Company in order to force the transportation company out of the refining business? The Empire Transportation Company was a company which owned a large number of tank cars. The president of it was Joseph D. Potts. Mr. Potts was probably as fully acquainted with the subject as any man who ever lived in the United States; a man of very great ability and with very wide knowledge of that subject." (Reading). I believe they did; I believe that was the object of their onslaught upon us." That is the testimony of Mr. Cassatt.

GETTING RID OF THE EMPIRE TRANSPORTATION CO.

Q. (By Senator Daniel.) Who was prosecuting? A. The Commonwealth of Pennsylvania against the Pennsylvania Railroad. The Standard had a combination with three trunk lines to force the Pennsylvania Railroad to exercise its option to buy the cars of the Empire Transportation Company and to stop the refining of oil(so as to give the Standard Oil trust a monopoly of the business. That is on Page 177 of a book that was published by the Government. It was an investigation before the Committee on Manufactures in 1888.

Q. (By Mr. North) By the Pennsylvania Legislature? A. No; of Congress. (Reading) "Q. Was it after the Standard had threatened to withdraw its patronage from your road?A. Well, they had not threatened to withdraw their patronage from our road at the time, but they had protested very strongly against the Empire Line being interested in that New York refinery I spoke of before, and had complained that the Empire Line was giving facilities to that refinery, on account of their interest in it, they did not give to them, and had been endeavoring for several months to get us to insist upon the Empire Line going out of that refining business." That is the testimony of Mr. Cassatt on Page 178. Joseph D. Potts testified before the same committee of Congress on Page 261. He was the president of the Empire Transportation Company (Reading). "Q. I will call your attention to this subject. Do you not know, and did you not know at that time, through railroad officials or other sources, that the Standard Oil Company complained of the impropriety of a transporting line, upon which they were dependent for their supply of oil, being also engaged at the same time in competition with them in refining? A. Yes, sir; that was the point that was made." And at that time the transportation company's cars were purchased by the Pennsylvania Railroad, and their refining plant by the Standard Oil Company, and they went out of business.

METHODS USED TO PREVENT THE PASSAGE OF THE PIPE LINE BILL.

Q. (By Mr. Phillips.) What methods, if any, were used by the Pennsylvania railroad and the Standard Oil Company, or either of them, to prevent the passage of the pipe line bill in 1883? A. All methods that are usually known, I think, in Legislatures.

PRODUCTION OF CRUDE OIL BY THE STANDARD IN 1883.

Q. (By Mr. Farquhar). How much control of oil production did the Standard Oil Company have in 1883, compared with all others? A. Of oil production?

Q. Yes. A. I think about 5 per cent.

Q. Five per cent of all? A. Yes; you are speaking of production now. They had none directly, I think; it was through companies that were supposed to be, as they term it, affiliated with them, such as the Forest Oil Company, and probably the Anchor Oil Company, and one or two others.

THE STANDARD'S POWER BASED ON RAILROAD DISCRIMINATIONS.

Q. Then what you say is that the foundation of the strength of the Standard Oil Company, after the passage of the act in 1883, lay in their means of making combinations, particularly of pipe lines, and securing the whole control? A. Their great power lay in the discriminations which they obtained from the railroads over all other persons. That is found in the testimony before the same committee, on page 191.

THE STANDARD'S METHODS OF PREVENTING THE LAYING OF PIPE LINES.

Q. (By Mr. Phillips) What methods did they take, if any, before the passage of this through pipe line law, to prevent others from getting through to the seaboard? A. It was impossible to get the line to the seaboard without having the right of eminent domain. It would be useless to attempt it; because any one owning a little piece of land could absolutely prohibit the pipe lines passing over it. The original pipe line law only extended to certain counties, and as the oil business grew it went beyond the counties to which the law applied. It was difficult to lay lines even within the oil producing counties.

Q. (By Mr. Phillips) Were there other attempts to lay lines to the seaboard, and how did they undertake to circumvent them. A. I understand that when attempts were made to lay lines to the seaboard tracts of land were purchased—strips in front of the pipe line stations—so that the line could not be built without crossing them. By this means the Standard could prevent the laying of any pipe line, and I think did prevent it; so that it became absolutely necessary, in order to lay a line to the seaboard, that a corporation organized for that purpose should have the right of eminent domain.

THE STANDARD'S CONTROL OF TRANSPORTATION.

Q. (By Representative Otjen.) You said that in 1883 they controlled 5 per cent of the production. What per cent of the transportation did they control at that time. A. I think they cantrolled 90 per cent of it.

Q. Even at that time? A. Yes. A number of smaller pipe lines were laid through the oil country, and these were rapidly absorbed by the National Transit or the United Pipe Lines, which was a Standard organization. So that in 1883 they practically had command of all the transportation of crude oil.

Q. (By Mr. C. J. Harris.) Has it been their policy to control all new lines that have been laid since then? A. Yes.

Q. No matter what the cost? A. No matter what the cost.

AMOUNT OF THE STANDARD'S REBATES FROM THE RAILROADS.

Q. By Mr. Phillips.) Would they obtain rebates from the railroads? A. They obtained rebates from railroads. That is probably quite an old subject, and it is fully gone into here in the testimony of Mr. Cassatt. That is easily accessible to the commission. They got their power by means of rebates They got a rebate not only on the oil they shipped themselves, but on the oil everybody else shipped; a very excessive rebate. The rebate was so much that nobody else could stay in the business.

Q. How much did that rebate amount to in any given period of time? A. On Page 191 of the report of the Committee on Manufactures Mr. Cassatt said that at that time it was 80 cents a barrel.

Q. In round sums, do you know how much they obtained in the course of a year or such a length of time, from all the railroads. A. I should say it would run into the millions; probably as high as eight to ten millions a year.

Q. In rebates.? A. I think so.

Q. Is the precise sum stated in that testimony. A. The precise sum is stated on Page 191 (reading) "Q. I mean the tariff rate? A. One dollar and ninety cents. Q. What is the actual rate? A. If shipped to the Standard Oil Company at that time it would be 80 cents a barrel." It was just one-half, and it was even higher than that. I think it was higher than $1.16 a barrel.

THE STANDARD'S CONTROL OF TRANSPORTATION.

Q. (By Representative Otjen.) What percentage of transportation do they control now? A. They control probably about 88 to 90 per cent of it.

THROUGH PIPE LINES A BENEFIT TO THE OIL INDUSTRY.

Q. (By Mr. Farquhar) Was the establishment of these pipe lines to the seaboard a positive advantage to the oil industry of Pennsylvania as a whole? A. I think so.

EFFECT OF TRUSTS UPON THE CONSUMER.

Q. (By Mr. Phillips. How, in your opinion, do trusts affect the consumer? A. I think the trusts themselves seek to create the impression that the organization of trusts and the introduction of what they call the "economies of manufacture" reduce the price of the manufactured article to the consumer. I think that is, in fact, wholly erroneous—that instead of decreasing the cost to the consumer they increase the price to the consumer until it becomes absolutely extortionate. One would suppose that would be the case from the mere fact that these trusts are organized for the purpose of securing a complete monopoly of the business in which they are engaged. They permit no one else to engage in the same business if they can prevent it. They pay enormous prices for other establishments in the same line, for the purpose of closing them up and thus obtaining a complete monopoly of the business. When they have accomplished that, or approximately accomplished it, they have absolute control of the prices to the consumer; and I do not believe that any body of men anywhere, and especially when organized for the purpose of profit, can be trusted with the inordinate power of absolute fixing prices to the consumer. One would expect that they would fix extortionate prices in order that their profits might be high.

PRICES AT COMPETITIVE AND NON-COMPETITIVE POINTS.

I believe that it can be shown, in fact, that this has been the effect of the creation of trusts; and especially of the trust which was the first, and to this day is the greatest, the Standard Oil Trust. Now, that they do charge extortionate prices, it will be a very easy matter for this commission to prove, by simply getting the prices at which they sell refined oil at all points where they are without competition, and comparing them with the prices they obtain where there is a competitive market. I think it is always well to deal in the concrete rather than the abstract, and I will give an example which the commission can readily verify. In New York and Brooklyn and Jersey City, in 1895 and 1896—they were selling oil to the local merchants, and to what are known as the wagon trade as well as retailers, at 9 and 9½ cents a gallon. The Pure Oil Company having been organized on the 9th day of March, put a wagon on the streets in New York, and sold ten gallons of oil the first day at 9 cents a gallon. As soon as the Standard Oil Company knew that the Pure Oil Company was doing business in the city of New York and vicinity, they commenced a rapid reduction of their prices, until in July, 1896, they had reduced the price to 5½ cents a gallon for the best quality of water-white oil, in small quantities, at retail out of their wagons in the city of New York. On March 9, when the price was 9½ cents a gallon, the price of crude petroleum was $1.30 a barrel. That is a trifle over 3 cents a gallon. Crude oil is always measured by barrels of 42 gallons each. Three cents a gallon would be $1.26. When they put the price at 5½ cents a gallon, crude oil was $1.15 a barrel. In other words, they reduced the price of refined oil by $1.68 a barrel, while crude declined only 15 cents. Now, 9¾ cents a gallon was an inordinate price for refined oil in New York, and 5½ cents was below cost; they could not make the oil, transport it to New York, and sell it for that price and get cost for it. The condition is the same in Philadelphia, where there has been competition for two years.

Q. (By Mr. North.) How long did that continue? A. We put additional wagons on in a small way, and I do not hesitate to say we have lost money in New York every month since we started three years ago last March.

Q. Prices remain the same as they are fixed? A. practically the same; they are a little better now, although crude oil is no higher. Crude oil was $1.15 in 1896; it is now $1.13; yet the prices of refined are a little higher now than then. But I do not hesitate to say that by the competition which we introduced at *least* $3,000,000 has been saved to the people of Greater New York during the last three years.

Q. (By Mr. Phillips.) How about Philadelphia? A. The situation is the same in Philadelphia. The Pure Oil Company has been doing business in Philadelphia since the 19th day of June, 1896. And prior to that time another company, which our company succeeded, had been doing business there for years. The price of oil in Philadelphia is even lower than it is in New York.

Q. (By Mr. C. J. Harris.) This saving to consumers would not probably have been made without the competition? A. Oh, no; I think the price would have been maintained throughout the entire period at 9½ cents.

Q. (By Mr. Farquhar) This commission understands that these prices are carried by both competing companies in New York at a loss? A. Certainly at a loss. Their purpose is to drive competition out; and unless the company has a considerable capital it will be driven out. No individual can compete with them. They have absolutely destroyed all individual enterprise in the oil business.

Q. Would it not have been a better business method to adopt the price of the opposition company? That would have involved no loss to the company, but simply standing in as a competitor at the real cost without a profit. A. If you sold at all you had to sell at their price. We did not care to do business at a loss. We should have liked to avoid it if possible.

Q. (By Mr. C. J. Harris)) They made the reduction? A. They made the reduction and they made the cuts, and they did it to make it destructive.

Q. (By Mr. Farquhar) The cut, you said, was made from nine and a half to five and a half? A. Yes; from March to July.

Q. Were you in competition at the time of the nine-and-a-half rate? A. Yes; we commenced in March, 1896.

Q. At the nine-and-a-half rate? A. Yes.

Q. Was the price put down to five and a half at once, or was the first reduction to a middle figure? A. The first reduction, I think, was to eight, and then to seven and a half, then to seven, and quickly down to five and a half.

Q. (By Mr. North) Could you state the figure at which the oil could have been sold at that time with a

reasonable profit? A. Seven cents would have given a very handsome profit both to them and to us.

Q. (By Mr. Kennedy) I would like to ask the Senator to say something about the price of the same quality of oil in the States where the Standard has not this competition. A. The prices are very high. When you get entirely away from competition they get what prices they please.

Q. Can you name a case in any city. A. No. I can not give you the figures of other cities from memory; I know the figures here because it was business to know them.

Q. (By Mr. Phillips) These figures will be obtained and presented to the commission, no doubt in satisfactory shape? A. And it is true that wherever there is no competition their prices are high.

Q. We are still on the question how, in your opinion, do trusts affect the consumer? A. Give the trust the absolute power to fix prices, and they always fix them high. That is the only way they can get their inordinate profits on their watered stock, and the consumer, of course, must suffer. There is no question about it. No government should allow the power of absolutely fixing prices for the consumer on a given product to be lodged anywhere if it can be prevented.

THE NUMBER OF COMPETITIVE POINTS.

Q. (By Mr. North.) Are there many competitive points in the United States? A. Yes; there are a number of competitive points in the United States where the independent people have stations for distributing points for oil, but usually, I think at a very great disadvantage in their rates.

Q. Is the number of these competitive points increasing or decreasing? A. I think they are increasing as the independent interest is increasing. If that should diminish, they would correspondingly diminish.

THE INDEPENDENT COMPANIES MAKING LESS MONEY THAN THE STANDARD.

Q. (By Mr. Farquhar) In proportion to their capital are the independent companies making as much money as the Standard? A. I think not, if we are to judge by their declared dividends. I see that the Standard recently declared, for the last three months, a dividend of 3 per cent and a special dividend of 9. That would make 12 per cent in three months on a capital of $100,000,000, if the statement can be relied upon.

REFINED OIL FIRST TRANSPORTED IN PIPE LINES BY THE INDEPENDENTS.

Q. Through how many States did this pipe line need to go before it reached the seaboard? A. Pennsylvania and New Jersey. Probably it would be interesting for the commission to know that the independent interests first undertook the transportation of refined oil long distances by means of pipe lines. The independents laid a pipe line to transport refined oil from Oil City through Titusville and Warren, Bradford and Wilkesbarre, Pa., to Hampton Junction, N. J., for the purpose of reaching New York harbor. That line has been in operation four years, and has transported millions of barrels of refined oil, without the condemnation of a single barrel; and it was the only means that enabled the independent refiners to live. Without that they would have been driven out of business by the railroads.

OBSTACLES PUT IN THE WAY OF THE INDEPENDENTS' PIPE LINE.

Q. (By Mr. Farquhar.) Did these pipe lines find any trouble at all in getting their right of way? A. Oh, yes; certainly. Even in Pennsylvania they were hindered and delayed and stopped in a great many ways in reaching Wilkesbarre. Men went in advance of them and took options on the right to lay a line at very high rates, for the purpose of establishing rates for this line that was coming. They would offer to take an option for the right of way over a farm at very much more than the value of the entire farm.

Q. Is not that the usual way with a railroad or with a pipe line, that the second customer is the one that is very apt to pay an enormous rate? A. The first person that went through was not pretending to lay a line, but simply to fix the price for the one that did lay the line.

Q. (By Mr. Phillips.) Will you give an account of the start made with the United States Pipe Line, the double line, to ship both refined and crude? Will you state to the commission what adverse circumstances you met in the State of New Jersey in trying to get to New York? A. The line was projected by way of Hancock, on the Delaware River, and through New York to the Hudson River. When we reached a place near Hancock, on the Delaware River above New York, we found the Erie Railroad there with cannon and every appliance necessary to prevent the laying of the line. We also found that it would probably take us some years to get the land for that line through to New York, because the pipe line law of New York had been so amended as to make it very difficult to lay another pipe line. The law was not arranged to develope that plan of transportation, but to prevent the laying of additional lines. So we gave up the project of going to New York by way of Hancock, and started from Athens south to Wilkesbarre.

Q. That is Athens, Pa.? A. Athens is in Pennsylvania, about four miles from the New York line. We intended to lay the line directly across through New Jersey to the bay at New York, where a company with which we are associated, the Columbia Oil Company, has loading facilities. We reached the Delaware River and crossed it. Then we met the first objection, from the Belvidere Railroad, owned by the Pennsylvania. Although we owned an acre of land at the crossing, they enjoined us from crossing that by means of a bill in equity filed before the vice chancellor. His decree was reversed by the Court of Errors and Appeals, the highest

court in New Jersey, and we crossed the road; but they kept us back a year. Our line was completed to that point, but we were delayed a year in getting that link. Then we met our next difficulty in crossing the Delaware, Lackawanna & Western Railroad. We owned a line there. They undertook to take that line out. We maintained our position by force, but we had a delay there, and some of our men were hurt. We retained the line, and it is still there; it is still in litigation. We crossed under the Essex Canal at a culvert, owning that crossing, and reached Hampton Junction, and 51 miles from the harbor of New York. There are two lines from Bradford, Pa., to Hampton Junction, one for crude oil and the other for refined.

THREE GRADES OF OIL IN ONE PIPE LINE.

Three different grades of oil are transported through the same line. They push out a poorer grade with a better, and it is turned into its own tank by means of a valve. They run that second grade until they have transported the amount desired; then put in a third grade until they have transported the amount that is desired of that, and then repeat the process.

Q. (By Mr. Phillips.) Explain how you have been transporting these mixed grades to your markets. A. In pumping the oil along the line it does not mix for a distance of 50 feet; though of course that poorer grade mixes with the better for a short distance in the line.

Q. (By Mr. Farquhar.) Does the Standard use that same system? A. No, I think not.

Q. (By Mr. Phillips.) Are you the first to pump refined oil to New York? A. The first company that ever pumped refined oil any distance by means of the pipe line. I think the Standard is pumping distillate from the fields in Ohio for treatment.

NO FEELING AGAINST SENDING OIL AWAY TO BE REFINED

Q. (By Mr. Farquhar.) Was there not a feeling in Pennsylvania, and the oil district, against the transportation of crude oil, as withdrawing the benefits of refining from the localities? A. No, I think not; there is a pretty liberal spirit on that subject; they are selling oil to be refined wherever it can be refined cheapest.

REFINING DONE CHEAPEST IN THE INTERIOR.

Q. (By Mr. Farquhar.) Then you state that there is advantage in getting to the seaboard for your refining? A. No; I think the oil can be refined cheaper in the interior, and transported as refined by means of pipe lines.

Q. Giving employment to the locality where the oil is produced? A. Yes, I think so. I think so for several reasons: Land is cheaper, labor is cheaper and fuel is cheaper, and water is abundant and of a good quality.

Q. And living is cheaper? A. Living is cheaper.

Q. And it tends to diversify labor? A. Yes.

Q. Is there a better market at the seaboard for what you call the by-products or residuum than there is at your local refineries in Pennsylvania? A. I am not competent to answer fully. I think that the market for the by-products is all over the country, and probably one part of the country is as valuable a market as another.

THE STANDARD BELIEVED TO GET RAILROAD FAVORS IN PRICES FOR LUBRICATING OILS.

Q. (By Mr. Phillips.) Does the Standard have the monopoly of lubricating oil, especially as to the railroads of the United States? A. I want to mention something that I do not positively assert to be true. I do not know it to be true, but it is a matter of belief with me. I believe the Standard is getting as great advantages and discriminations from railroads as ever; but I think they get them in an entirely different way, and in such a way that I do not see how the matter can be reached. The purchasing of oil for a great many of the railroads has been largely taken out of the hands of the purchasing agents and put into the hands of the president or some managing director. I think that the Standard get their rebates from the railroads by means of the prices at which they oil those roads.

Q. By lubricating oil? A. Yes.

Q. Does that require a large amount? Is it a very large item of expenses? A. I think the railroads of this country can be lubricated for one-half the amount which they pay today, and a large profit made out of it; but the railroads are simply giving rebates in that way.

Q. (By Mr. Farquhar.) As a business proposition, does it make any difference to a man selling oil to a railroad whether he goes to the president of the railroad or to a purchasing agent? A. Yes, I think it makes a difference; because the purchasing agent is supposed to buy his oil at the very lowest prices. It is different in the case of the president.

Q. (By Mr. Farquhar.) Is there any proof by which you know that the purchasing agent gets competitive prices on oil? A. No.

A REFINERY WITH $500,000 CAPITAL CAN GET ALL THE BY-PRODUCTS.

Q. (By Mr. Jenks.) The statement has been frequently made that, owing to the very large capital of the Standard, they get the refined very much cheaper than the independents do, because they are able to get more by-products. Can you tell us whether you, for example, have as good facilities for refining as the Standard? A. I presume that in refining a large quantity of oil there would be a slight difference in favor of the large refinery; but I think it would be so slight as to make no real difference. I think the independent people make just as good oil as the Standard Oil Company, and better.

Q. Do they get also substantially the same by-

products? A. They can get also the same by-products if they have the facilities to make them.

Q. Does it require anything like the capital the Standard has to get an establishment big enough to make use of these by-products? A. Oh, no.

Q. How large? A. I suppose a capital of $500,000 would make a complete refinery with a perfect division of labor, so as to get out every by-product at the very lowest possible cost.

THE STANDARD HAS NO ADVANTAGES IN COST OF PACKAGES.

Q. Would the same thing hold with reference to the materials they use in shipping? With reference to the cost of tin cans and barrels? A. The making of tin cans is a very simple process; it is all done by machinery, and they are made very rapidly. I think others can manufacture them just as cheaply as they do. Barrels can be manufactured just as cheaply as the Standard Oil Company can make them. I judge they cannot manufacture these things any cheaper than other people, because they do not do the other parts of the business any cheaper than the other people. They are not any better producers than the independent producers, nor as good; and they do not transport the oil any cheaper through a given size of pipe than we do.

THE STANDARD'S ADVANTAGE IS NOT IN PRODUCTION BUT IN DISCRIMINATIONS.

Q. When you say that they are not as good producers as other people, do you mean that they do not take as good care in their refining as the others do? A. I think very possibly they do not. If an oil compnay is in the business of producing oil individually, they are giving their own personal attention to that specific thing. In the case of the Standard Oil Company, all their production must be under the supervision of paid agents, who are not as skillful in the business as the men that have been in it for thirty years themselves.

Q. In your judgment, then, any advantage they have comes from some special discriminations or through monopoly, and not from any legitimate advantage they have through large capital? A. I think you are entirely correct; they have not much advantage, so far as the actual doing of the business is concerned, except through discriminations .

THE STANDARD MAKES A HUNDRED PER CENT ON ITS REFINED OIL.

Q. (By Mr. C. J. Harris.) You said the price of oil was 9½ cents in March, 1896; that would give them at wholesale rates a profit of 50 per cent., would it not, according to their own figures? A. It would give them a profit of 100 per cent.; the cost of oil would be—

Q. (Interrupting.) I do not mean on the crude, but I mean after it was refined? A. It would give them 100 per cent. They could buy the oil so as to make the profit very close to 100 per cent.

Q. That is a pretty big profit for a wholesale business, is it not? A. I think so.

COMPETITIVE POINTS—THE RAILROADS PREVENT COMPETITION ON THE PACIFIC COAST.

Q. (By Representative Otjen.) I understood you to say there are about a hundred competing points; where are they? In what part of the country? A. I can give you a good many of them: New York, Philadelphia, Pittsburg, Chicago, Milwaukee, Rock Island, Evansville, Memphis, St. Louis, Des Moines, Kansas City.

Q. Any on the Pacific coast? A. They have such a great advantage, by means of rules the railroads have adopted, that it is almost impossible for independent companies to sell large quantities of oil on the Pacific coast. The Interstate Commerce Commission has assessed against a number of railroads, in favor of the independent refineries, the sum of $86,000, which it has found that the railroads should pay to the independent refineries by reason of discriminations; and suits are pending for that sum in the United States Circuit Court at Pittsburg.

Q. (By Mr. C. J. Harris.) Does not the Standard Oil control the country trade almost exclusively? A. Very largely they control trade which only railroads reach. The competitive points are where you can get away from railroads and get water transportation.

Q. (By Mr. Kennedy.) Has the Standard Oil Company been making attempts to secure control of these independent companies? A. In 1894 and the beginning of 1895, they had conferences with some of the independent refineries. The independent pipe lines declined to sell. A number of refiners declined to sell; but they did, at that time, purchase oil refineries along our pipe line, which were under contract to take oil from us; and, although they were in good condition, and one of them was practically new, they tore those refineries down and destroyed them.

Q. Did they offer much more than the properties were worth? A. Yes; they offered more than the properties were worth.

Q. (By Mr. Phillips.) What other methods did they take to get control of the independent pipe lines? A. They reduced the price of oil at the seaboard, so that oil was sold at the seaboard for a long period below the cost of the crude in the oil region, and the refineries had to suffer a large loss.

THE STANDARD BUYS STOCK IN INDEPENDENT COMPANIES AND GETS A DIRECTOR IN ONE.

Q. Did they or did they not purchase stock in any of these independent pipe line companies? If so, how much and in what companies? A. The first company we organized was the Producers' Oil Company, Limited, with a capital of $600,000. There were 1,095 subscribers to the stock. They were

scattered over about 300 miles, in territory widely separated from each other and from the officers, and the Standard Company started to get control of that company. They had a bank cashier working for them in nearly every town throughout the whole region where the stock was owned, and they had agents in the field. They commenced purchasing that stock at par, and before they got through they paid as high as 220. They secured a majority of the stock—$1,000 over one-half. Then they brought suit to get into the company. They were beaten. The stock was put in the name of John J. Carter. He claimed to be the owner. It was owned by the National Transit Company, and they transferred it to him on the 16th day of January, 1896. He brought suit to become a member of that company without being elected to membership. It was a limited partnership, and the law provided that no one who purchased stock could become a member without being elected by a majority in number and value of their interests. He alleged that he was one of the original subscribers to the stock, and that by buying additional stock he was entitled to vote such additional stock at the meetings, and he asked for a transfer to him. That was denied by the company. He lost in the court below and in the supreme court. That was one of the means they were taking to get control. He told me he had purchased stock for the purpose of getting control of the company and changing its policy from one opposed to the Standard to one in harmony with it. They bought stock in the United States Pipe Line; and in order to prevent their getting control of that stock the majority was put in the name of three trustees who could vote it at all meetings of the company.

Q. About how much stock did they purchase in the United States Company? A. Some $350,000 to $400,000 out of the $1,200,000 paid-up capital. We refused to recognize them as stockholders in that company. They brought suit to get in, and they won in the court below. The case was taken to the supreme court and, on a technicality, the appeal to the supreme court was quashed.

Q. Have they or have they not a director in that company? A. They have one director in that company now.

Q. How did they obtain that director? A. They obtained that director by the purchase of stock, and through the decree of the court that they should be entitled to vote at the election.

THE INDEPENDENT COMPANIES ARE SEPARATE, BUT OWNED PRACTICALLY BY THE SAME PEOPLE.

Q. (By Mr. Kennedy.) Have the independent companies found it necessary, in order to protect themselves against the encroachments of the Standard, to enter into a form of combination? A. Only as to control; combination of interest. They are practically owned by the same people. They would be much stronger, undoubtedly, if they were welded into one organization.

Q. Then, practically, they are not independent, but independent of the Standard Oil Company? A. They are independent of each other and also independent of the Standard.

Q. Did you say whether they were controlled by the same people? A. By way of illustration, the refineries are all owned by different people, individuals or companies; each man owns his own refinery, and each company owns its own refinery. They take oil from the pipe lines and pay us the 15 cents pipage, while the Standard pipage is 20 cents. We have always maintained a uniform price of 15 cents for local pipage. They sell their oil where they please; bid against each other, and bid against the Standard. They are entirely independent.

INDEPENDENT COMPANIES ABSORBED BY THE STANDARD.

Q. (By Mr. A. L. Harris.) How many independent companies have been absorbed by the Standard Oil Company? A. I should say over a hundred in the last twenty years.

Q. Is there such a thing as a list of those companies and the amount of capital of each? A. Yes; there is a list of the refineries that were obtained and dismantled in the testimony of Senator Emery before the Committee on Manufactures in 1888.

WHY THE REMAINING INDEPENDENTS REFUSE TO SELL.

Q. (By Representative Livingston.) What stands in the way of absorbing the remaining companies? The fact that they produced enough to meet the demand, or are they trying to work at lower figures because they are not willing to sell? A. Because they are not willing to sell; that is one reason.

Q. (By Mr. Farquhar) Do you mean by that that there is so much profit in the independent lines that they can ask two prices and will not sell? A. No; we refused to sell at 112—that is, 12 per cent above cost—when we expected to go into the hands of the sheriff and be sold out. We maintain those companies largely as a matter of sentiment, and as a protection to the independent producing interests.

Q. Do they stay out of sentiment or feeling toward the consumer, or is it because there is a large profit, present and prospective, in keeping them out of the Standard Oil Company? A. No; men naturally want to remain in the business they have selected, and with which they are acquainted; they are satisfied with moderate profits, and they do not like to be driven out of their business. There is an American pride in being able to maintain a place in a business that a man feels that he is entirely competent to carry on, and has adequate capital to carry on if he has a fair chance.

Q. (By Mr. Farquhar) Is it not a fact that the independent companies of this country are making money, and making a sufficient percentage on their capital, and is not that one of the reasons why they do not sell? A. That is true just at present; but this proposition to purchase them was made after they had been doing a

losing business continuously for twenty months, and in that twenty months had lost $200,000 among them in actual money. Then they declined to sell.

PRACTICAL EXPERIENCE OF MEMBERS AND MEN OF THE STANDARD OIL COMPANY.

Q. You mentioned the fact some time ago that you thought those who were interested in the independent companies, and had been brought up in the business, and had long experience in it, are better managers than the agents that the Standard Oil Company employ in refining, or transportation, or selling. Is it or is it not a fact that in their acquirement of these plants, the Standard Oil Company has usually taken the expert mixers and refiners of those concerns into the working force of the Standard Oil Company itself? In other words, under the controlling spirits of the Standard Oil Company to-day, have not the men in the field had as wide experince as any independent company can have? A. No, I think not. I think, with the exception of one trustee, none of the trustees have had any experience.

Q. What is the experience of Mr. O'Day? A. He has had experience as a pipe line man. Mr. Archbold, I think, has had quite a large experience as a refiner. I think he is a competent man in that business.

Q. When they absorbed the Galena Company, did they not take the best operatives of that company into the employment of the Standard Oil Company? A. What Galena do you refer to?

Q. The Ohio. A. That is located at Franklin. I think the same men are in that company that have always been in it.

PRESENT CONDITION OF REFINERIES THAT WERE REPORTED AS INDEPENDENT IN 1888.

Q. (By Mr. A. L. Harris) Please turn to page 438 of that report. (House Reports, First Session, Fiftieth Congress, 1887-88, Volume IX.) How many of those companies in that list are in existence at the present time? A. I can not speak of Cleveland. Of New York, Borne, Scrymser & Co. have been absorbed by the Standard, and I think Lombard, Ayres & Co. They are marked there, though, as affiliated with the Standard then. Pittsburg: Bear Creek Refining Company is a Standard works now, I understand; Iola Oil Works is a very small works; and the Globe Refining Company, I think, is Standard. Oil City: The Keystone Refining Company was wrecked and torn down; Standard became the purchaser of it at sheriff's sale, I think. The ground is bare now with the exception of a few tanks.

Q. (By Mr. Phillips) By whom was it torn down? A. The Standard.

Q. (By Mr. A. L. Harris.) As you go on please state what has become of the different companies that have gone out of existence and how they went out of existence, whether acquired by the Standard Oil Company, etc. A. Reno: The Mutual Oil Company was purchased by the Standard in May, 1895, wrecked and torn down; nothing left standing but a chimney as a monument of disaster; I am not sure but the chimney is down now. Franklin: Those are small refineries; they are not running, I think; I think the most of them are shut down. I do not know anything about those at Buffalo, Toledo, Findlay, Lima, Bradner, Smith's Ferry, Boston, or Baltimore. Bradford: Those are not in existence now; I do not know what became of them. Parkersburg: One of the refineries that was in existence at that time has been absorbed by the Standard. Marietta: I am not informed as to those refineries. Titusville: Rice, Robinson & Witherop are running now as an independent company. John Schwartz's refinery was practically destroyed by the flood. He then united with the National Refining Company in the Union Refining Company. That was bought by the Standard in 1895 and torn down. The International Works (J. P. Thomas) was absorbed and purchased by the Standard in 1895. It was practically a new works and in fine condition, but it was torn down. The National Oil Company was united with the Union, and the Union was purchased and torn down by the Standard. The same is true of the Western Refining Company; they went into the Union; they united those refineries, leaving but two practically of that number now in existence at Titusville, and one that has been erected since by the Manhattan Oil Company, known as the Oil Creek Oil Works. Clarendon: I am not familiar with those; they are small works; I think one of them is still operated by the independents; I think the other is not in operation now. San Francisco: I am not informed as to that. Philadelphia: Bosshart & Wilson are not in business. As to the others I am not informed. Florence, Colo.: I am not familiar with them. This list was made, I see, in 1888.

BONUSES FOR IDLENESS.

Q. (By Mr. Phillips.) Have you any information in regard to the paying of a large bonus or premium for refining works to remain in idleness, or have you any information in regard to their paying sums of money to persons to stay out of the business? A. I know that within the last five years, and prior to that, they leased a number of refineries, and simply shut them down, and allowed them to remain idle. As to persons receiving money to remain out of business, I have no personal, absolute knowledge of that subject; only common rumor.

Q. Do you know as a fact that they have leased works that have been shut down for a period of years? A. Yes, I know they have.

Q. And paid large sums of money? A. Yes, I know that has been done.

CONSUMERS WOULD PAY LESS IF THE STANDARD OIL COMPANY DID NOT EXIST.

Q. (By Representative Livingston.) What, in your opinion, would be the price of oil to the consumers if the Standard Oil Company should be abandoned? A. I believe that the average price to the consumer, all over the United States—all over the world—would be

very much less than it is to-day, at the same price for crude oil.

Q. Why? A. The reasons are that anyone who is permitted to take whatever he chooses is never moderate in his taking. They have the ability and power to take from the consumer just what they please, where there is no competition; and I do not think that anybody would be moderate under such circumstances. I do not believe that anybody should be trusted with unlimited power to fix prices.

Q. You think, then, that competition would so rule and control the independent companies that they would be forced to sell oil for a lower price than the Standard now charges? A. Yes; I have not a bit of doubt about it.

PROFITS OF THE INDEPENDENTS AND OF THE STANDARD.

Q. That being true, what interest has the independent company in forcing the disintegration of this company? A. Just this interest: they stand always in mortal dread of being entirely wiped out. They do not know whether they can live six months or a year; they always have to fight for their lives, and they do not make fair profits even now; they have not made what would be called fair manufacturing profits at any time in the last five years.

Q. (By Mr. North.) What do you call fair manufacturing profits? A. They would be entirely satisfied to do this business at 10 cents a barrel on the oil that runs through their refineries. I think the Standard makes $1.50 to $2 on every barrel that goes through its refineries.

Q. About what per cent? A. That would be about 10 cents a barrel on the amount the independents refined.

Q. What per cent of profit on the investment? A. With oil at $1 a barrel, that would be about 10 per cent.

Q. Which you call a very good manufacturing profit? A. Yes, I should say so. I have heard independent refiners say they would be entirely satisfied to enter into a contract for any number of years, to make 10 cents a barrel on every barrel of crude oil they refined; and with oil at $1 a barrel, that would be about 10 per cent. profit.

THE FOREIGN MARKET—THE PURE OIL COMPANY.

Q. Have you any knowledge of the price at which the Standard sells its product abroad? A. The Pure Oil Company was organized in 1895 for the purpose of aiding the independent refiners—organized in an open meeting held at Butler, January 24, 1895. The purpose was stated to be to organize a company that would take the oil from the refineries at cost; they were willing to refine oil at cost if they could live that way. They were willing to say they would continue in the business and give it to the new company at cost, without making a cent. This company was organized for the purpose of taking that oil at cost and marketing it abroad.

Q. (By Mr. Phillips.) Please state what means the Standard had taken to destroy the market abroad that these independents were working on? A. They had made the market abroad so bad that oil was sold in New York for a number of months below the cost of the crude at the refinery, without anything for refining it and without anything for transporting it from the refineries to New York. The refiners had lost large sums of money. Then they said they could not continue unless they were aided by the producers. We formed the Pure Oil Company for the purpose of taking the oil at cost, in order to enable them to stay in the business and not be driven out by the Standard Oil Trust. There was an open meeting, held in the opera house at Butler, and the stock of that company was subscribed there to the amount of $65,000 in a few minutes. It went on until it now has a capital of $375,000, with an authorized capital of $1,000,000, and that company has been buying oil from the independent refiners and marketing it abroad. They have a station erected at Hamburg, Germany; their own tankage, their own tank cars. They have one at Rotterdam, Holland; their own tankage, barrel houses, pumping outfits. They are erecting one at Mannheim, on the Rhine in Germany, and they rent a plant at Amsterdam, Holland. Those plants were established, one of them two years ago last October, the other a year ago the first of April, and the third is in process of erection. The oil is transferred to those plants by means of tank steamers, pumped out and distributed just as the Standard distributes it throughout Germany.

DISCRIMINATION PREVENTED IN GERMANY.

I want to say here, and I say it with a blush for this country, that everyone can do business in Germany on an equal footing, and nobody has any advantage over another. It ought to be true in the United States. It is a sad thing.

Q. (By Senator Daniel.) Please explain that a little. A. They do not permit any discrimination; they will not allow it.

Q. By whom? A. The government will close up an establishment and keep it from doing business if they enter into discrimination.

Q. (By Representative Livingston.) You mean to say they prevent trusts and combinations? A. I think they do; at least they prevent trusts and combinations having any advantage over an individual.

Q. (By Mr. North.) Or fixing of prices? A. They will not permit that; they will not permit anybody to do business at a loss.

Q. For the sake of destroying a competitor? A. Yes. They will not allow that.

GERMAN BUSINESS OF THE INDEPENDENT REFINERS.

COURSE OF THE STANDARD.

Q. You have not quite answered the question I originally asked you. A. What was that?

Q. I wanted to know how the foreign prices of the Standard Oil Company compared with the domestic prices. A. Prior to that time the independent refineries sold nearly all the oil they marketed in Germany to a man by the name of Poth.

He frequently said he could not do business in Germany at a loss—which we have found to be true—and of course that gave him a right to say what he could pay for oil. He got rich out of the purchase of oil from the refiners in a period of a few years.

Q. (By Mr. Phillips.) Independent refiners? A. Independent refiners; and finally he sold out to the Standard Oil Company. After he had done it he was overwhelmed with grief when he found the refiners had stood by him. He went home and died within three days. He is dead and his business is carried on by the Standard Oil Company.

Q. Did they take any means to buy tankage? A. They would often tie up all the tankage at a given point, and they sold oil abroad at low prices for a period.

Q. (By Mr. North.) At lower prices than they were selling for in this country at the same time? A. Yes.

QUALITY OF EXPORT OIL.

Q. (By Mr. Jenks.) What is the quality of export oil compared with what is used here? A. The oil for export, while it is called a second-grade oil, is really about as good a burning oil as the very highest quality. The refiners tell me they would as soon burn what is called export oil as "water white." It does not burn quite as white, but it is a good quality of oil.

MARKET CONDITIONS IN GERMANY AND ENGLAND.

Q. (By Mr. North.) Are you able to carry on competition in foreign countries without those disadvantages which you encounter at home? A. A great deal better in foreign countries than in America. Competition is preserved in Germany to a very much greater extent than in the United States. It is in England, too.

Q. (By Mr. Phillips.) Is the Pure Oil Company making a profit? A. The Pure Oil Company is making a profit; doing a profitable business.

Q. (By Mr. North.) Selling at market rates abroad? A. Selling at market rates and doing a good business.

DIFFERENT RESULTS OF PURCHASES OF INDEPENDENT PLANTS BY THE STANDARD AND OTHERS.

Q. (By Mr. Ratchford.) You stated that 100 or more of these companies were absorbed by the Standard Oil Company. Has there been any such thing as transfer of property or plant from one of these independent concerns to another at any time? A. Very frequently; that is, interests will be sold.

Q. They have bought and sold to each other? A. They change ownership to some extent.

Q. The reason that others have not sold to the Standard Oil Company is because they are unwilling to sell? A. Yes.

Q. If these independent concerns have bought and sold and changed ownership, have they not been absorbed by each other in the same sense in which the Standard Oil Company has absorbed some of them? A. No. A works is not absorbed in changing ownership. The business is carried on just as it has been carried on before.

Q. When an independent company buys another company or plant or property it continues to operate it? A. Yes.

Q. The only difference, then, between them and the Standard is that in the one case the plant is bought for the purpose of operation, and in the other for the purpose of destruction, leaving it waste A. Very frequently it is bought for the purpose of destruction.

Q. I should think the term "destroyed" or "laid waste" would be a better term than "absorbed." A. I would say absorbed—dismantled—which means destroyed.

THE STANDARD'S PRODUCT HAS DETERIORATED.

Q. Has the quality of the product of the Standard Oil Company improved during the past twenty years? A. I think it has deteriorated in quality. I would like to give a reason for that: Prior to twenty years ago they did not use any Lima oil, or oil that has sulphur in it; within the last twenty years they have used a very large proportion of Lima oil. Therefore, I think their manufactured oil generally is not as good as it used to be.

Q. (By Mr. Phillips.) For what reason is the Lima oil mixed? A. The Lima oil is said to contain arsenic and sulphur; one clouds the chimney and the other makes a bad odor.

Q. (By Mr. Ratchford.) How about the by-products? A. No doubt they make their by-products very lucrative to themselves.

THE PRICE OF REFINED OIL HAS FALLEN ONLY WITH THE PRICE OF CRUDE.

Q. Have their prices been materially reduced during the past 20 or 25 years? A. I read a statement made before this commission by a gentleman who, I think, was not at all familiar with the oil business, Mr. Thurber, of New York. The prices have not been correspondingly reduced with the cost of the material employed. In other words, there has not been a relative reduction in the price of refined, as compared with the cost of the crude. I think they had nothing to do with the making of the cost of the production of the crude. All improvements in drilling the oil wells and in producing crude have been made by the people who were actually engaged in that business; many of them workingmen.

Q. Are you prepared to say whether or not the cost of, say, half a dozen other articles of common use has or has not fallen proportionately with that of the products of the Standard Oil Company? A. Yes; I think nearly all staple articles have been reduced within the last 20 years in larger degree than the price of refined oil.

Q. (By Senator Daniel.) Has not the price of the crude article fallen much more in proportion than the price of the refined? A. Undoubtedly. I am going to speak of that hereafter.

THE STANDARD'S PROFIT PER GALLON HAS INCREASED.

Q. (By Mr. Jenks.) You suggested that Mr. Thurber had brought up some figures. I think this chart here [pointing to chart on the wall] shows the figures that have been quoted so frequently by the Standard Oil Company, and that were quoted by Mr. Thurber. This upper line [indicating] shows the price of refined, the lower, the cost of the crude; the perpendicular distance between them shows the cost of refining plus the profit. These figures are often quoted by the Standard to show that they have very largely reduced the cost; these are the dates here [indicating]—the Standard Oil started about 1872—up to the time of the formation of the trust in 1882. Can you tell us whether or not these average figures show definitely the way in which the Standard fixes its prices? A. Your dots there between your lines indicate the cost of refining plus the profit.

Q. Plus the profit, because this, the lower line [indicating], is the price of the crude, and this, the upper line [indicating], is the price of the refined. The third line drawn with reference to the base line shows the difference between the two.

Mr. Farquhar. Would not that diagram show that since the Standard came into the trust they have run the refined and the crude almost parallel?

Professor Jenks. There has been a slight reduction all the time, and of course the Standard men will say, as anyone would, that when you get the price of crude down to less than a cent a gallon there is not any probability of getting it reduced much below that. I thought Senator Lee would explain that, because those are the figures often quoted.

A. I am told by the refiners that in 20 years the cost of refining has been reduced from 2½ cents a gallon to less than one-half cent. Of course those lines, being parallel, show a very much larger margin of profit.

THE STANDARD'S PRICE FOR REFINED OIL HAVE NO RELATION TO COST.

Q. (By Mr. Jenks.) Also state further, with reference to the way they fix their prices, whether it is merely arbitrary? A. I do not think the Standard Oil Company fixes its prices on the basis of the cost of refining and cost of crude at all. They rather try to avoid doing that. They do not want the public to understand how they fix their prices. They are entirely arbitrary. They have had very low prices for refined oil when crude was very high, and very high prices for refined oil when crude was very low.

Q. (By Mr. Phillips.) Does not that come about through their selling and supplying the market for a number of months ahead? A. Probably through their selling ahead, and then putting up the price of crude, so that their competitors may have to pay a high price for the crude, while they themselves are manufacturing the crude they have already purchased, to make refined which they have sold at a high price.

THE BETTER CONDITIONS IN GERMANY AND ENGLAND HAVE ENABLED THE INDEPENDENTS TO LIVE.

Q. (By Mr. Kennedy.) You stated that the conditions of competition in Germany and Great Britain have been such that you could make a profit there, and the Standard Oil Company could not drive you out; and in this country their methods have been ruinous to you, so that you could not make a profit. Has the profit you have been able to make in Germany and Breat Britain in years past been the means of enabling your companies to live, notwithstanding the methods of the Standard in this country? A. Yes.

Q. How long have you been operating in these countries? A. In Germany for three years next October. The price of export oil, which is a second grade oil, has been almost as high as "water white" oil. The cost of drilling the oil wells and obtaining oil is very much greater within the last three or four months than it was last year on account of the advance in our materials and the prosperous conditions of the country; but they have kept the water white oil, the oil sold in this country, very low during this last year.

SELLING BELOW COST TO CRUSH COMPETITORS NOT PERMITTED IN GERMANY AND ENGLAND.

Q. I understand that the Standard has in some instances almost given away oil to drive out competition. Is it true that they could not give away oil if they wanted to in Germany or Great Britain? A. No; I do not think they would be allowed to do that there.

Q. The government would come in and say, "You cannot sell this oil a cent a gallon less than the other people?" A. I do not think they would be permitted to do that.

Q. (By Representative Otjen.) I presume that would be with the understanding that they were doing it with the object of crushing somebody else out? A. Yes; that would be the object.

Q. (By Mr. Kennedy.) The government would be the judge of their motive? A. I do not think they would be permitted to do it.

Q. (By Mr. Farquhar.) Is there any act of Parliament that would prevent their giving away oil or selling it at half price? A. The government is simply mildly despotic.

Q. How do you reconcile that with the fact of American meats coming into competition with the German, and cutting the English price probably 33 per cent? A. I suppose those are sold at a profit. They do not prevent the selling of the goods, but they will not allow one company to have an advantage over another, and they will not permit business to be done at a loss.

Q. (By Mr. Kennedy.) I would like an explanation of how they would prevent a company from

doing business at a loss? A. They will close you up.

Q. (By Mr. North.) You mean to say they guarantee that every man who goes into business shall make a profit? A. No. He can quit when he pleases.

Q. (By Senator Daniel.) Are you speaking from an examination of the German laws on the subject? A. Speaking from a knowledge of business done there in the last ten years.

Q. Give us some item of your own knowledge.—A. In regard to business with Mr. Poth he said to us that he was not permitted to do business at a loss. Their books are open to inspection under some law.

Q. Where was that?—A. In Germany.

Q. What place—A. He was doing business at Hamburg and Mannheim and a number of other places in Germany. He said he could not do busines at a loss; therefore he must do business at a profit. Since we have got in there, our agents sav they are not permitted to do business at a loss. They will not allow us to sell goods at a loss and do a losing business. We can close up and quit.

HOW THE STANDARD MAKES PRICES HIGH TO CONSUMERS AND YET RUINS COMPETITORS.

Q (By Mr. Jenks.) You said the prices were considerably higher in your judgment than they would be if there had been anything like free competition, and yet that it was very difficult for these independent refiners to get along and make a living. Please tell us a little more accurately what the methods of the Standard are that make these two things consistent.—A. In any market reached by independent oil they will put the price down so low that there is no profit in marketing oil; and at points not reached by the independent refiners they will put the price up so as to recoup their loss at the competitive point. They have accurate information as to every shipment. For instance, a shipment will be made by an independent refiner, and before that oil reaches its destination they will land a cargo of oil in the same place, to be sold at a very much reduced price. They will reduce their prices two or three days before that oil arrives, so as to prevent the man who bought it from selling it again. If he buys it once he is to lose on it, because he has paid a higher price than he is able to sell it for. Then they send some one to him to tell him, "You can not buy independent oil. You must buy from us." That is the method of every trust.

Q. (By Senator Daniel.) Have they done that in Germany?—A. No; they are not allowed to do that in Germany.

THE STANDARD HAS THE BUSINESS IN FRANCE.

Q. (By Mr. Jenks.) Now, you will perhaps add a word with reference to the way they get along in France.—A. I do not know much about the French, except that the Standard Oil Company does most of the business of France.

EXPORT OIL—TESTS REQUIRED BY STATE LAWS.

Q. (By Representative Livingston.) Can that oil be sold in the States?—A.In some of the States. It can be sold in Pennsylvania. Generally it is not up to standard required in the States here, or not conconsidered so. It is probably as good oil in fact as is burned in the United States, but it is excluded by reason of statutes that have been passed.

Q. What is the gravity of the oil you send over there?—A. It is called 73 Abel test. I am not familiar practically with the specific gravity.

Q. What does the State law of New York require, or of any other State—110?—A. Yes; 110, or about 120 to 150. One hundred and fifty is the highest grade of water white, and about 48 gravity. I have heard them use that expression in connection with water white. One hundred and fifty, 48 gravity, is considered the best oil.

AMOUNT OF OIL EXPORTED.

Q. (By Mr. Jenks.) What proportion of the refined product is exported and what proportion is consumed here?—A. About 40 per cent of all the crude manufactured is exported in the shape of refined—that is, besides lubricating oils.

LIMITATION OF PRODUCTION IN 1887.

Q. Along a good many lines of industry it has been found necessary, where the competition was sharp, to export large quantities. Has this large export business, perhaps on the whole, enabled the Standard to keep prices higher than they could otherwise? Has there been any special attempt to limit production here in order to keep prices up?—A. There was at one time a movement to limit the amount of crude produced; that was in 1887. They reduced it about 17,500 berrels a day in that year. That is fully entered into in this book (referring to "The Derricks Handbook of Petroleum").

AMOUNT OF OIL EXPORTED.

Q. (By Representative Livingston.) I have been furnished with the statement of the statistics for last year, to the effect that about 52 per cent of all oils were exported.—A. I said 40 per cent of the amount manufactured from the crude oil is exported in the shape of refined. In addition to that 40 per cent, if whatever lubricating oil was sent abroad were added, it would probably make it about 50.

COMPETITION AND PRICES ABROAD—PENNSYLVANIA OIL, LIMA OIL, RUSSIAN OIL.

Q. Abroad, where the oil of the independent refineries goes, which is not of such grade as can be consumed in the States here, does it come into competition with oil sent there and sold by the Stand-

ard?—A. Yes; the Standard is doing a very large business in Germany. Germany is the largest oil market in the world. Although the population is about the same as France, it uses probably twenty times as much oil as does France. I think I am not far wrong in that.

Q. Does the sale of the oils from the independent refineries bear down the prices of the Standard Oil Company's product there?—A. No; they sell at very fair prices. Even for the last two years abroad the prices have not been excessive, and they are reasonable all round.

Q. You mean the Standard Oil Company's?—A. The Standard prices and the independent prices.

Q. What if you should withdraw or be forced out of the market?—A. We think their prices would be very much increased.

Q. (By Mr. Farquhar.) Is there any difference between the grade of standard oils sold by the Standard Oil Compay generally in Germany and that of the independent companies?—A. We think we sell a very much better oil than they do, for the reason that we do not manufacture any but Pennsylvania oil, while they do manufacture and export some Lima oil that we believe is mixed with the other. I do not speak positively about that, for I do not know.

Q. (By Mr. Kennedy.) Do you meet much competition in Germany from the Russian oil fields?—A. The Russian oil has not been largely used in Germany because it does not climb the wick as well as Pennsylvania oil or American oil, and the Germans have their own lamps and they do not change them readily. It has not been largely used, although the Standard has been pushing the introduction of Russian oil. It is said it has bought a large amount of Russian oil, and has been trying to push that in the German markets as against Americani oil.

THE STANDARD HAS NO APPRECIABLE ADVANTAGES IN PROCESSES.

Q. (By Mr. Jenks.) The Standard Oil Company has often claimed that it has a decided advantage by virtue of the patents it has succeeded in getting with a large number of establishments that have been purchased. In your judgment does it have much advantage along that line?—A. No; I think their process of manufacture is very similar to that employed by the independent refiners.

Q. (By Mr. Farquhar.) Suppose you add "formula" to patent in that question?—A. I do not believe they have much advantage in that regard, if any.

CUT PRICES FOR COAL—EFFECT UPON THE MINERS.

Q. (By Mr. Jenks.) Do they have any advantage in the matter of getting fuel cheaper?—A. Yes; I think that all the large consumers have an undue advantage in securing fuel. I think that has served to very much depress labor. In other words, when they want an amount of coal they practically fix their price. They say, "We will take this coal if you will furnish it at a certain price; if you do not furnish it at that price we will not take it." As they use a large amount, the coal companies must furnish it, and in order to get even they cut the men. That is why the miners have been cut down from good prices to poor prices—by the demands of these large companies for coal and other raw material at too low a price. The operators must furnish it, and in order to furnish it they must cut their men.

The commission took a recess from 1 p. m. to 2 p. m.

EFFECT OF TRUSTS ON PRODUCERS OF RAW MATERIALS.

Q. (By Mr. Phillips.) The question is, How do trusts affect the producer?—A. The reason why I desire to state first why, in my opinion, the effect of trusts upon the consumer is to make him pay a higher price for the manufactured article is because in doing so it is their aim and object to get a complete monopoly of the business. When they have once gotten a complete monopoly of marketing a certain manufactured article, they have the producer of the raw material as absolutely in their power as they have the consumer. They can fix for him whatever price they please and compel him to take it, and the only thing they do consider is whether he will remain in the business and produce that raw material for them at a given price. They simply allow the producer of the raw material to get about cost out of it, or a very little margin, if any, of profit. Now, speaking of the Standard Oil trust, prior to the time when they virtually obtained a monopoly, the price of crude oil was very much higher than it has been at any time since.

PRICES OF CRUDE OIL, 1869 TO 1897.

In 1869 the price was as high as $7 per barrel; in 1870, $4.90; in 1871, $4.75; in 1872, $4.10—no, higher than that, $4.55; in 1873,—now their power began to be felt, not as the Standard, but as the South Improvement Company—in 1873 the price declined; the highest price in 1873 was $2.75 and the lowest was $1.05. In 1874 the highest price was $2.07½ and the lowest was $0.82½. In 1875 the highest price was $1.82½ and the lowest price was $0.97½. In 1876 the highest price was $4.23¾ and the lowest was $1.98¾. In 1877 the highest price was $3.63⅜ and the lowest $1.96¼. In 1878 the highest price was $1.63¾ and the lowest $0.95⅞. In 1879 the highest price was $1.28¾ and the lowest $0.70⅝. In 1880 the highest price was $1.24⅜ and the lowest $0.86⅞. In 1881 the highest price was $1.01¼ and the lowest $0.80⅝. In 1882 the highest price was $1.37 and the lowest $0.61⅝. In 1883 the highest price was $1.24¾ and the lowest $0.97¾. In 1884 the highest price was $1.15⅝ and the lowest $0.75. In 1885 the highest price was $1.12⅝ and the lowest $0.75¾. In 1886 the highest price was $0.91¾ and the lowest $0.66. In 1887 the highest price was $0.90 and the lowest $0.65⅛. In 1888 the highest price was $1 and the lowest $0.82¼. In 1889 the

highest was $1..12½ and the lowest $0.86. In 1890 the highest price was $1.07⅝ and the lowest $0.72¼. In 1891 the highest price was $0.81⅜ and the lowest $0.61⅛. In 1892 the highest price was $0.63½ and the lowest $0.53. In 1893 the highest price was $0.80 and the lowest $0.54¾. In 1894 the highest price was $0.95¾ and the lowest $0.80⅝. In 1895 the highest price was $2.60 and the lowest $1.00⅝. In 1896 the highest price was $1.50 and the lowest $1.05. In 1897 the highest price was $0.96 and the lowest $0.65.

RELATIONS OF THE STANDARD TO THE PRODUCERS OF CRUDE OIL.

These are the quotations from the open market. In January, 1895, the Standard Oil Company quit paying the market price for oil, as it was bid upon the oil exchange, and simply hung out the price they would pay for what are known as credit balances, amounts standing to the credit of each individual producer upon their books. They would pay that price and no other.

Q (By Mr. North.) What effect did that have on the market?—A. It enabled them to fix absolutely the price of oil. Speculation, the general trade in oil, had no effect upon the prices. They controlled the price absolutely by determining what they would pay.

Q. (By Mr. Phillips.) Did this shut up buyers and the oil exchange?—A. Well, it almost entirely killed speculation, and drove brokers in oil into doing business in other lines. You will observe, from the figures I quote, that, prior to the time of the Standard Oil Company combination, competition largely controlled the industry. The prices of crude oil were very much higher than they have been since. Beginning with 1895, they averaged about $1.05 a barrel. During the ten years prior to that the average of crude oil was below 80 cents. That was generally an unprofitable price. Men could not produce oil and get cost for it, and maintain the production.

Q. (By Representative Otjen.) Still some men could?—A. Yet the general industry could not do it at the price that prevailed for ten years prior to 1895. So I say the effect of the trust upon the producer of the raw material has been to compel him to take an unremunerative price for the oil product. You might ask why he did not sell his product elsewhere The pipe line runs to the well, the oil is taken into the pipe line, and as they had absolute control in the refining business, or almost so, they were able to fix the price at which they would take that oil. There were no outside purchasers of that oil; if they produced it there was no other place to put it.

Q. The pipe led to the lines connected with the refineries of the Standard Oil Company?—A. Yes.

Q. (By Representative Livingston.) You had no other connecion?—A. There were no other connections. There were some few independent refineries; but they bought all their crude from the Standard Oil Company and paid them 20 cents, local pipage rate.

OVERPRODUCTION DID NOT DEPRESS THE PRICE OF CRUDE OIL.

Q. Prior to 1895, for ten years, you say the oil averaged about 80 cents.—A. Less than 80 cents.

Q. Since that about $1.05.—A. Yes.

Q. What had the overproduction and underconsumption to do with those prices during that period? A. I think, nothing. There was a time when there was an overproduction. In 1881 the Bradford field, was opened. The production in McKean county, known as the Bradford field, averaged very close to 81,000 barrels a day during 1881. That created a heavy stock of oil, until, in August, 1884, there were 39,000,000 barrels of oil in stock.

Q. That must have depressed the price.—A. The price of oil was higher in 1884, as you will see by the tables, than it was subsequently, when the stock was reduced one-half and the production was smaller. Take the year 1884 and compare it with 1897.

Q. In 1880 it was $1.24 and 1884 it was $1.12 or $1.15; there was a decrease between 1880 and 1884 of ten cents a barrel?—A. The average was higher in 1884 than in 1880, as given by months in this table. Then take 1887; the production was not as great in 1887 as it was in 1884.

Q. And yet the price was lower?—A. The average price in 1887 was about 66 cents a barrel. The stock was then 31,000,000; it had been 39,000,000 in 1884. The production was, I think, about the same in 1887 as in 1884; I can tell in a moment by looking.

RESTRICTION OF PRODUCTION IN 1887.

Q. (By Mr. Jenks.) Was there not an effort made to restrict production at about that time?—A. There was an effort made, and it succeeded. By arrangement with the Standard Oil Company, in 1887, the producers purchased from the Standard 6,000,000 barrels of oil at a fixed price of 62 cents, and shut in their production to the extent of 17,500 barrels a day.

Q. (By Mr. Phillips.) Reducing that much?—A. Reducing that much.

THE CONDITIONS THAT MADE HIGH PRICES OF 1870.

Q. I would like to bring your attention to the price of 1870, $4.90 a barrel; in 1890 you got $1.07 highest and 72 lowest. What was it that enabled the producers of that oil to live at $1.07, when in 1870 they got $4.90?—A. In 1870 the producers made a great deal of money. They had a good market. Buyers came into the field to seek the producer, and to buy the oil directly from him and pay him. Some days it would go up half a dollar a barrel when there was competition for it. Many people were getting it for independent refineries. They would go right to Oil Creek to meet the pro-

ducers, and say: "How much petroleum have you—a thousand barrels? I will give you $4 for it;" and make a contract right on the spot. Open competition for the oil made the price.

THE COST OF DRILLING WELLS HAS DIMINISHED, BUT NOT THE COST OF TRANSPORTATION.

Q. Has the cost of production been very greatly lessened since that?—A. Yes; they are drilling wells at very much less cost than in 1870.

Q. The pipe system reduces the cost of transportation? A. No; transportation has not lessened.

Q. I mean from the line out?—A. The line runs to the well. The price of local transportation has never been changed since the Standard Oil Company introduced their lines. When they laid their first lines 2-inch pipe was worth about 35 cents per foot; last year it was worth 6 cents per foot. They charged 20 cents then, and they charge 20 cents now; there has never been any decrease in the cost to the producer, or to any one who desires to have oil transported by local pipe lines.

Q. What is the surplus in barrels at present?—A. The surplus stock of oil is a little over 11,000,000 barrels in Pennsylvania oil and about 14,000,000 barrels in Lima oil. A year ago Lima had more than 22,000,000 barrels surplus. Pennsylvania has increased its surplus about a million barrels the last year.

Q. The market is not gluted with that oil?—A. No; the stock is not more than should be carried for safety.

CRUDE OIL HAS BEEN PRODUCED AT A LOSS, ON THE WHOLE.

I want to say one thing in regard to the producers. I have been intimately acquainted with them since I was a boy; I have lived among them; they have been my clients; I have been familiar with their business. I have never known a more energetic, able, and determined lot of men than the producers of petroleum, and yet, as a body, they have not grown rich, but rather poor. There were individual instances of producers becoming wealthy—many of them—but they were engaged in speculative business, in which there are always chances of certain persons becoming rich. I believe the great body of producers have put money in rather than taken it out.

THE TOTAL PRODUCT IN 1879, 1890, 1891.

Q. What was the total product of the oil wells in 1870 and the total product in 1890?—A. The production of Pennsylvania oil in 1890 was about 35,000,000 barrels; I think the production in 1870 was not over 5,000,000 barrels. That is from recollection. I am a little way from the exact fact, but not far. I think the production was about 90,000 barrels a day in 1890. In 1891 it ran up above 100,000 barrels a day by the discovery of the McDonald field, which was very prolific.

CAUSES OF CHANGES OF PRICE OF CRUDE OIL.

Q. I want to get a basis for an opinion as to what produced this rapid decline of prices from 1870 to 1890; that is the reason I asked this question.—A. That was entirely arbitrary; there was nothing to reduce prices so destructively as that.

Q. Did the consumption increase as fast as production?—A I think consumption kept pace with production.

Q. Is there any way of showing that?—A. The export tables will show that it is true as to export oil, and I think it is certainly true as to home consumption.

Q. (By Mr. Farquhar.) How do you account for the abnormal prices of 1876 and 1877?—A. There was an open competitive market, and the Standard Oil Company was not really a factor in it yet. Those prices were the effect of speculation in the open exchanges.

Q. You mean to say those prices were entirely speculative prices, and not product prices?—A. People bought oil for manufacture as well.

Q (By Mr. Phillips.) Had not the discovery of fourth-sand oil under the third-sand deposit something to do with lowering the prices very materially about 1873? Were the very high prices of 1876 and 1877 the result of a reaction of the very low prices that preceded?—A. I think the discovery of the Butler field, which was a very prolific field of oil, had something to do with the lowering of the prices in 1873, 1874 and 1875. Then there was a reaction. Oil went as low as 46 cents in 1873 or 1874.

Q. I have known it to be sold as low as 40 cents. A. Yes; since.

A MANUFACTURING COMBINATION CAN DEPRESS THE PRICE OF RAW MATERIAL.

Q. You said a moment ago in your opening remarks that the refineries controlled the producers of raw material; is that not true with all refining and manufacturing? Take flax, take cotton, take hemp, anything you please; does not the manufacturer, in the last analysis, control the price of the raw product just as these refineries control the price of crude oil?—A. But if there are a great many persons in the manufacture, there is competition between them, and that affects prices.

Q. Provided there is no combination there?—A. Yes; but where there is a combination the price is fixed arbitrarily. The combination simply fixes the price and the producers must take it.

REFINING BY PRODUCERS—OWNERSHIP OF WELLS.

Q. If these producers should refine their own oil, what would be the result?—A. Then they would have to meet the Standard Oil Company in the refining markets.

Q. Would the Standard Oil Company have to go out of existence if the producers should refine their own oil?—A. If they refined it all, certainly; but the Standard people are producers.

Q. (By Mr. North.) To a considerable extent?—A. About 23 to 25 per cent, I should say, of the entire production.

Q. (By Representative Livingston.) Will you please tell us how many independent wells there are? A. I think there are from fifty to sixty thousand wells in existence. Over one-half the production is owned by men who own less than 10 barrels a day apiece, so you can see the extent of the independent production.

Q. There is no way for those independent producers to refine oil, is there?—A. They are attempting to do it in the companies I represent. They are attempting to transport it, and their independent refineries are attempting to refine it. The stock of the Producers Oil Company, Limited, and the Producers' and Refiners' Oil Company, Limited, is owned chiefly by producers.

Q. (By Mr. Kennedy.) It seems to me this independent question is becoming a little bit mixed. When you say "independent producers of oil," do you include these individual companies?—A. I include all companies that are not under the control of the Standard Oil Company.

Q. Then you say the Standard Oil Company produces only about 25 per cent of the oil that is produced?—A. Twenty-three to twenty-five per cent.

Q. That is, these independent producers produce 50 per cent of the oil?—A. Probably 75.

THE EXPORT TRADE—CONDITIONS AND EFFECT.

Q. (By Mr. Farquhar.) In what form were your first exports to Europe? Was it refined petroleum or crude?—A. Both refined and crude were exported.

Q. In what year was oil exported first?—A. I think oil was exported to Europe as early as 1870; probably before that.

Q. What effect does the export trade in oil have on the market?—A. It gives a market for just the kind of oil they use, and to that extent widens the market.

Q. (By Mr. North.) You get a drawback on tin plate?—A. We have never transported any oil in cases.

Q. Does the Standard Oil Company transport any oil in cases?—A. To some extent, but I think largely supplying their Eastern market from Russia and making tin cans——

Q. Drawback has at one time been a large source of revenue to them?—A. It has enabled them to manufacture their cans here, getting a drawback on the tin they used in the manufacture.

Q. (By Mr. Farquhar.) Has not this export trade equalized the profits between the producers in this country and the sales in their home market and Europe more than ever in the prices there?—A. It has helped to do it.

Q. Suppose you were in a measure restricted to prices that you would call not living prices, would you not have the export market in Europe with equal prices there, as you say? You could live if you had to sell 60 per cent of your product at a loss and made a small profit on the other 40 per cent?—A. It would not take long to waste our capital at that.

Q. So you say you must hold a place in the home market as well as the European?—A. I think that the foreign markets do help the independent interests to maintain their foothold, and the Standard seems to have a greater facility in crowding out independents in America than there.

Q. Does this foreign market tend to maintain the domestic price?—A. I think it does.

Q. This foreign consumption seems to be enlarging all the time; does that not go against the idea of a monopoly on the part of the company which produces only 25 per cent of the whole crude product of America?—A. They produce only 25 per cent, but they virtually control 50 per cent more, because they fix the price on that additional 50 per cent. Therefore I do not think the foreign market does minimize the effect of the Standard Oil Company monopoly.

WHY THE PRODUCTION IS KEPT UP, THOUGH MOST PRODUCERS LOSE.

Q. You wish to say that the producers of this country do not receive a fair price for their product? A. They certainly have not. I do not think that the counties which have produced oil are as well off as they would have been if they had never produced a barrel of oil; yet about 800,000,000 barrels of oil have been taken out of those counties.

Q. (By Mr. Kennedy.) At an average cost of what?—A. I think the average cost of taking it out has been about $1; and for ten years, when producton was great they got very much less than that.

Q. (By Mr. Phillips.) Perhaps you might explain to the commission why the production could keep up under these circumstances. A. It is a speculative business. One man would come in and drill a well, get a thousand-barrel well and grow rich. The hope of that sort of thing led men to put a great deal of money into drilling these wells. They all hoped to get large wells; they did not find them. More money has been put into the business in ten years than has been taken out of it. Still people make money, though prices are low. There are wells that run as high as 15,000 barrels a day. Of course a man who has a well of that kind will make a large amount of money.

CAUSES OF CERTAIN FLUCTUATIONS OF PRICE.

Mr Jenks. I want to see if you have made clear the causes for three or four of the most important fluctuations. I understood you to say that the South Improvement Company was formed in 1872, and that within the two years there was a great fall in price. What influence did the South Improve-

ment Company have in the way of forcing these prices down, if any?—A. I think it had the effect of forcing prices down, because they had combined with the railroads and controlled transportation to a very great extent, and the producers became frightened. Eighteen hundred and seventy-three was the panic year. You will remember the panic had some effect on prices. At that time, also, there was a new discovery, in Butler county. That promised to be a very prolific field; and it proved to be.

Q. Those two factors worked together?—A. Yes.

Q. Then in 1876 and 1877 there was a decided increase in price. You state that was partly due to speculation and partly to the fact that the Butler oil field had been largely worked out and the Bradford field had not yet been opened.

Q. There was in the year 1883 quite à decided rise, yet it was limited. I think the highest price was—

Q It was not so high as it had been before?A. $1.24¾ per barrel.

Q. What time was that in the year?—A. I don't recollect just now. It was the average for the year. That was largely due to the giving out of the field known as the Cherry Grove field, which was opened in June, 1882. The wells were very large, but they did not last a great while. In the fall of 1882 they commenced to decline, and because of that decline the prices went up.

Q. (By Mr. Phillips.) Did not the Bradford field decline at that time very materially?—A. A great many people thought the Bradford field was giving out. I think that was owing to the decline of the Cherry Grove field and also the decline of the Bradford field.

Q. In the years 1888, 1889 and 1890, did that increase come largely from the limitation of the production of the Standard Oil Company?—A. My recollection is that the stock of oil was reduced from 31,000,000 barrels in August, 1887, to about nine or ten millions in 1889. That, of course, would account for that rise, although it ought to have been much greater.

Q. There is another decided increase in 1895.—A. In 1893 the price was decidedly low. The McDonald field ran as high in 1891 as 81,000 barrels a day, and at one time 91,000. That caused quite a reduction in price; that was a natural reduction.

Q. In 1894 the prices were $0.95¾ highest, and $0.80⅝ lowest; in 1895 it went up to $2.60. That was a tremendous rise.—A. That was entirely arbitrary. The Standard advanced the price 25 cents per day for a period of about seven days, running the market from $1.12 to $2.60 per barrel.

Q. (By Mr. Farquhar.) Was that helpful to producers?—A. It helped the producers that had oil on hand to sell.

Q. Still, in the succeeding year, it only went down to $1.50, so that was but a year's holdings of oil.—A. It went lower than that, I think—to $1.05 at the lowest.

THE COST OF PRODUCTION OF CRUDE OIL.

Q. (By Mr. North.) Are we to infer from your testimony that the Standard Oil Company arbitrarily fixed the price of crude oil at a figure which it knew to be below the cost of production?—A. Yes; that is undoubtedly true, for in 1887 the price was maintained at 65 cents for months. Everybody knows it can not be produced for that. That is away below cost of production.

Q. (By Mr. Phillips.) As a whole?—A. As a whole, I mean, it can can not be produced for that.

Q. (By Mr. North.) Will you state your judgment as to the cost of production at the present time?—A. It would, of course, be only an opinion. I think it can be produced now, and the amount of production maintained, at from $1 to $1.20 per barrel; but without much profit.

Q. The cost would vary according to local conditions?—A. Yes.

Q. (By Representative Otjen.) And the flow of the well?—Yes. Over one-half of the wells now being operated produce less than half a barrel of oil per day; over 25,000 wells produce less than half a barrel a day, wells actually working every day.

Q. (By Mr. North.) Are not all those wells producing at a loss?—A. In some places, where they couple them up, one man will operate probably 30 or 40 wells; then there is some profit at the present price of oil, but very little. In some cases they operate them at a loss. I have asked some of them why they continue to do that, and they said, with the hope that prices will advance so that these wells will become profitable.

Q. (By Mr. Jenks.)These prices that you give are prices at the wells?—A. At the wells.

THE COST OF PIPING.

Q. Piping is still 20 cents?—A. Yes; local piping.

Q. Could you give any estimate as to what the cost of piping is now?—A. I think the cost of pipage would be between 7 and 8 cents a barrel.

THE SHUT-IN MOVEMENT OF 1887.

Q. (By Mr. Phillips.) Senator Lee has referred several times to what was called the "shut-in" movement in oil, or limiting the production. It might be interesting and profitable if he would state what led up to that "shut-in" movement, and what action, if any, was taken in regard to the labor employed throughout the fields?—A. The price of the oil was below the cost of production during the year 1887. The average price that year was about 66 cents a barrel. The Standard Oil Company said that they wanted to treat the producers fairly, but that they had an excessive stock of oil on hand—31,000,000 barrels—deteriorating in value, and that if we wanted to have a better price production must be decreased, so that they could use up that stock of oil,and take it off the market, and save loss by wastage. A number of the leading producers met a

number of the Standard people at Niagara Falls and, after discussing the subject, the produers agreed to limit their production, in order that the Standard might dispose of that excessive stock of oil. I met with them, and I remember the contract by which the producers purchased from the Standard Oil Company 6,000,000 barrels of oil, to compensate them for limiting the production, and also to compensate the labor they employed; because it would cut off the revenue of the men who were in the industry. Mr. Phillips, who was in that movement, insisted that we should set aside 2,000,000 barrels of oil to compensate the laboring men who were in the industry, and who would be thrown out of employment by cutting off the drilling of wells.

Q. The executive board of the Producers' Protective Association?—A. Yes; it was the executive board of the Producers' Protective Association that took that action, and the reason for doing so is well expressed in the preamble of this contract. I will read that. It is on page 69 of that same book—Committee on Manufacturers, 1888.

"Whereas there has accumulated, in past years, an excesive stock of crude petroleum, which is deteriorating in quality, and a portion of which each year becomes sediment, valueless for any purpose, and the carrying of which excessive stock requires the expenditure of vast sums annually; and whereas in consequence of the existence of said stock the price of crude petroleum has for the past year been largely below the cost at which the same was produced; now, in order, as far as possible, to preserve the said stock from further waste and to conserve the public interest and our own, this agreement witnesseth: * * * "

Then the producers agreed to reduce their production 17,500 barrels per day, and purchase 6,000,000 barrels of oil from the Standard Oil Company at 62 cents. They were to give the profit of 2,000,000 barrels of it to the well drillers and pumpers who would be thrown out of employment, and to keep the profit on 4,000,000 barrels. That oil was sold separately; and the laboring men actually realized about $50,000 more profit for their share than the producers did out of the 4,000,000 barrels.

Q. How was the money distributed?—A. That was distributed through their organization, the Well Drillers Union. They were allowed $1 a day for the time they were unemployed by reason of this movement.

Q. (By Mr. Jenks.) The Standard Oil Company was itself in this movement?—A. The Standard Oil Company put up a million barrels and the independent producers put up a million barrels for the laborers.

Q. (By Mr. Phillips.) Have you anything else to say in regard to production?—A. No; I have not. I believe that if there had been fifty concerns engaged in the manufactur of petroleum, just as wide markets would have been obtained, and that while the consumer would not have paid any more for his oil, the producers would have realized a much better price and would have had a handsome profit. As it is, I think they have not made any profit.

Q. (By Representative Livingston.) Where is the balance of that money now?—A. I think the Standard Oil Company could explain that. I think they have realized in the neighborhood of five hundred millions in profits or more.

THE PIPE LINE COMPANIES—CUSTOMS OF THE BUSINESS.

Q. (By Mr. Jenks.) Will you explain to us briefly the system of pipe line service and the use that the producers can make of the pipe lines? Tell us how they give a ready market.—A. The oil is gauged by gaugers, who run it into the line for the oil company and give the producer a ticket showing the amount of oil that is run in that day. That is telegraphed to the pipe line office, and they keep books showing the amount of oil due each producer. Any day a man can call at the pipe line office and sell whatever amount of oil stands on the books to his credit at the price that the pipe line company fixes. If he desires, when he gets a thousand barrels, he can take out a certificate. That is, a certificate saying that he is entitled to 1,000 barrels of crude oil from such and such a line.

Q (By Mr. North.) That certificate is negotiable?—A. Yes. It can be sold on the open market.

Q. (By Mr. Jenks.) Then it practically amounts to this, that any producer can every day receive cash for what he has put in?—A. Yes; that is it; and it is true of all pipe lines. They must buy whatever is offered to them; not by law, but as a custom of the business.

LIMITED ACTIVITY OF THE INDEPENDENTS IN FOREIGN MARKETS.

Q. (By Mr. Kennedy.) Have the independent companies followed the Standard into the Eastern markets,—A. Only in a limited way. The independents have not sold oil to any extent in India or China or South America or Africa.

Q. The Standard Oil Company has worked up the markets in all those countries, has it not?—A. They do sell oil in all those countries, yes. That is so far away from home that with our limited amount of oil it would be unsafe to enter into competition with them there.

OIL EXCHANGES—NEW YORK AND OIL CITY.

Q. (By Mr. Farquhar.) Do you care to say anything about the New York Oil Exchange?—A. I think not. When the exchanges were in existence and doing business, the Oil City Exchange always fixed the prices.

EFFECT OF THE STANDARD'S ENTERING THE PRODUCING FIELD.

Q. (By Mr. Phillips.) What effect, if any, upon the production of oil, has been produced by the Standard's having entered the producing field in recent years?—A. On production?

Q. On producers or production?—A. I think it has tended to reduce the price of crude. They are very able competitors, and they could go into very deep fields to drill by means of their money, and could drill very deep wells and help keep the production high.

Q. Have they or have they not monopolized a large amount of the prospective oil territory under lease? A. They have leased it in very large blocks in West Virginia, paying an annual rental and holding it for future development.

Q. Has that in any material way prevented producers from obtaining leases.—A. Undoubtedly, to whatever extent they secured the territory and kept others from coming into it; and with their large means they have been able to secure and hold very extensive blocks of territory.

THE STANDARD PAYS GOOD WAGES, BUT NO BETTER THAN THE INDEPENDENTS PAY.

Q. (By Mr. North.) Are you familiar with the course of wages among the workingmen in the main?—A. Yes.

Q. Will you tell the commission how their wages compare today with those prior to the organization of the Standard Oil Company?—A. I do not think wages are as high as they were before the Standard Oil Company began business, but I do not think it is owing to that fact. It was a new industry, and in a new industry of that kind wages are always high. They have paid, and do pay, very good wages.

Q. The Standard Oil Company?—A. Yes; but not any better than the independent producers pay; in some cases not so good. But they — I want to do justice to them in that regard—I think they do pay good wages.

Q. (By Mr. Ratchford.) The claim has been made by the Standard Oil Company that they pay the highest rate of wages to all branches of labor employed, including pipe line men, traveling salesmen, etc. Is this claim, in your judgment, correct, or otherwise?—A. I think they pay a certain class of men in their employ very high wages. To men that are looking after departments of their business I believe they pay very high salaries. To ordinary labor I think they pay just what the independent producers pay, and others engaged in the same industry.

Q. Traveling salesmen?—A. I have no knowledge on that subject.

THE STANDARD OIL COMPANY MANUFACTURES 90 PER CENT OF THE OIL.

Q. (By Mr. A. L. Harris.) Can you furnish this commission with a list of the independent refineries now doing business?—A. Yes.

Q. With the amount of output substantially?—A. Substantially.

Q. You have not that amount?—A. No.

Q. Can you furnish the commission with the list of refineries now operating either by or with the Standard Oil Company?—A. No; I could not do that.

Q. What changes have been made since April, 1888, as defined on page 350 of the book from which you have quoted?—A. You mean what refineries have gone over to the Standard?

Q. Yes.—A. I think they control 90 per cent. They manufacture 90 per cent of all the crude oil manufactured in the United States. If they do that, there is only 10 per cent left for others; and controlling 90 per cent, they can absolutely control the price. They are able to sell at a loss until they have driven their competitors out of the business; they have done that repeatedly.

A COMBINE IS HARDER TO DEAL WITH THAN AN INDIVIDUAL.

Q. (By Mr. Livingston.) Suppose there was no Standard Oil Company. Suppose that I, as an individual, manufactured 90 per cent of all the crude oil produced in the United States. Would not I, as an individual, just as emphatically control the price as the Standard now does,—A. Yes; undoubtedly.

Q. The trouble is not so much that the Standard Oil Company are a combine, but rather that they manufacture the crude oil. Does not the simple fact that they manufacture 90 per cent, whether they are in a combine or out of a combine, give them the absolute power to fix the price?—A. Yes; but I think that I would rather compete against an individual owning 90 per cent than against a trust owning 90 per cent, for the reason that when the trust does anything wrong there is always some other wicked person that does it, and not the person who is caught. If you were doing it you would have to be responsible individually for whatever was done. But in a large combination of that kind you never can reach the person that does the wicked thing—it is always somebody else.

THE STANDARD OIL COMPANY A MONOPOLY IN RESTRAINT OF TRADE.

Q. (By Mr. North.) Do you regard the production of 90 per cent of refined oil as constituting a practical monopoly of that business?—A. Certainly.

Q. Then you think the Standard Oil Company is a monopoly in restraint of trade?—A. I do, undoubtedly.

Q. And that it exists in defiance of the laws of the United States?—A. Yes.

PRICES PAID BY THE STANDARD OIL COMPANY AND THE INDEPENDENTS.

Q. (By Mr. A. L. Harris.) You stated that after 1895 the Standard Oil Company ran down their price. I desire now to know whether the independent companies made any effort to increase the price fixed by the Standard Oil Company?—A. The

companies with which I am connected have at times paid from 1 cent to 9 cents a barrel more than the Standard Oil Company was paying; at times they have paid the same price. They have never paid less, except that once by accident, for half a day, we paid half a cent less, I think.

Q. Did that have any effect on the price offered by the Standard Oil Company?—A. I question it. We had a better price; I do not know what brought it about.

Q. If it made no impression on the price they offered, it is very good evidence that they control the price of crude oil?—A. They would hold their price at a fixed point, no matter what we paid.

RAILROAD DISCRIMINATIONS.

Q. (By Mr. Farquhar.) You said that the Standard Oil Company had been able to secure discriminating rates from railroads for the transportation of their products. Can you state to the commission any cases in which it has been proved in open court, or before the Inter-State Commerce Commission, that they did receive discriminating rates from railroads?—A. Yes; in the case of a bill in equity filed in the supreme court of Pennsylvania, on page 191 of the report of the Committee on Manufactures, 1888, you will find the testimony of Mr. Cassatt, that they had received 80 cents a barrel from the Pennsylvania Railroad.

Q. Was this a sporadic case, or was it general?—A. It continued until the Standard wiped out all the refiners between Titusville and Pittsburg at that time.

Q. At that time?—A. Yes.

Q. How long did that last?—A. It lasted probably a year.

Q. Would you say now that they still receive a discriminating rate from the roads?—A. That I have no proof of; but I was attorney in a case brought against the Pennsylvania Railroad by Logan, Emery and Weaver, when the general freight agent of the road said there had been no discrimination, the president of the road said the same, and a number of their chief officers; but when we subpoenaed their auditors, they came and testified that there had been discriminations. Those discriminations ran from 3 cents a barrel up to 28 cents a barrel. The amount of them in one year, as against Logan, Emery and Walker, was something over $24,000. They were testified to by both auditors, and the auditors' statements were brought in showing the exact amount.

Q. (By Mr. Jenks.) When was this?—A. My recollection is that the suit was tried in 1889 or 1890. They compromised the suit and paid $30,000 for these discriminations.

Q. (By Mr. Farquhar.) Do you independent companies own tank cars?—A. Yes; the independent refiners own tank cars. The Producers' Oil Company, Limited, own 48.

Q. Has there been any discrimination on the part of railroads in hauling these cars?—A. Yes.

Q. As between the independents and the Standard?—A. Yes.

Q State as explicitly as you can where it has occured and when.—A. It has occured on nearly all the roads, and those questions are in litigation. The Inter-State Commerce Commission assessed against the Pennsylvania and other roads a sum equal to $86,000. Suits brought by the independent refiners against the railroads, for the recovery of that money, are now pending in the circuit court at Pittsburg.

Q. You spoke some time ago about the rebate. Will you state the average price of oil when the 80-cent rebate was given?—A. It fluctuated, of course; but it was from $1.50 to $2.50 a barrel.

Q. (By Mr. A. L. Harris.) What was the character of the rebates at the time you speak of in the Pennsylvania oil district? What I mean is this: What was the amount of the rebate, and whom did that rebate go to in that district?—A. That rebate was in the shape of checks, I suppose, or cash, and it has been estimated to have amounted to ten millions of dollars. It went to the Standard Oil Company chiefly, I suppose. I do not know how it was divided.

Q. (By Mr. Phillips.) Is it or is it not in the testimony of Mr. Cassatt—was it not given, and the length of time, with the receipts of amounts?—A. It is in testimony on pages 242 and 243 of the work on trusts.

Q. Can you give the commission the exact amount in dollars?—A. It is estimated to be, from October 17, 1877, to March 31, 1879, $10,155,218.

Q. For how many months?—A. From October 17, 1877, to March 31, 1879; a year and five months.

Q. (By Mr. A. L. Harris.) Was it paid to the railroad and then paid back to the Standard Oil Company?—A. The independent shipper would ship his oil and pay the open rate—we will say, $1.80; and 80 cents of this freight that he paid was handed over to the Standard Oil Company. They got the rebate not only on the oil they shipped, but on the oil he shipped. No one could stand that. I do not say that 80 cents is the amount, but they did that in some instances.

Q. (By Mr Jenks.) Governor Harris has asked you if you could furnish a list of the refiners that are in your company. Would you be willing to add to the list of those establishments also the capital stock of each one and the market value of it before it came in? Do you think you could get it?—A. Yes.

Q. I presume it may be a matter of record—and the capital in case any firms came in that were not corporations. Were any of them bonded?—A. I think they were principally out of debt.

Q. So that there would be no bonds to put into a list of that kind. Did any of them have preferred stock as well as common stock?—A. I think not; not any of the refining companies.

Q. Would you be willing to give the details in reference to their stock?—A. I think they would be entirely willing to submit them to the commission.

Q. You will be kind enough to add that to the list?—A. Yes.

Q. You said this morning that you knew of a number of refineries that had been purchased by the Standard and dismantled,—A. Yes.

Q. Can you give us a list of those?

REASONS FOR DISMANTLING REFINERIES.

Q. (By Mr. Farquhar.) What are the usual reasons for dismantling a plant? A. Those plants were under contract with the Producers and Refiners' Oil Company, Limited to take oil from them. I can conceive two reasons for dismantling them: First, to prevent them from being in the trade as competitors: second, to injure the Producers and Refiners' Oil Company, Limited. The Standard declined to sell any of the material to the other independent refineries. They paid large prices for them and wasted the material; at least, they dismantled them, and refused to sell them to other independent refineries.

Q. When the commission hears representatives of the Standard Oil Company, that question of the commercial and legitimate reasons for dismantling may come before us. I should like your position on it. A. I think it was done to take them out of competition, and to injure the only competitor that was in that field. I know of no other reason. They were good plants, well located. There would certainly be no reason for paying a high price for a plant and merely tearing it down, unless there was some design of that kind.

ONLY A MODERATE RISE OF PRICE WHEN PRODUCTION OF CRUDE OIL WAS LIMITED.

Q. (By Mr. Livingston.) Seventy-five per cent of this oil is produced by the independent oil companies outside of the Standard Oil Company. If they could by consent and agreement reduce the production one-half, what effect mould that have on the independent companies? Would it largely increase the price of crude oil? A. They did enter into an agreement to reduce the production 17,500 barrels a day, and it did not largely increase the price of crude, though it reduced the stock from 31,000,000 to 9,000,000.

Q. It did not? A. It did not; it increased it to some extent, but not to the anticipated extent.

DISADVANTAGES TO EMPLOYES OF HAVING ONLY ONE POSSIBLE EMPLOYER.

Q. (By Mr. Phillips.) Have you any further remarks to make or information to give in regard to the effect on labor?

Q. (By Representative Livingston.) Do you mean to say that it is lessening the price of labor? Is that the idea? A. I am not speaking so much of what has been done by trusts, but my opinion is this: That when all the people that are skilled in any branch of industry come to be employed by a single concern, and there is nowhere else to go to seek that kind of employment, they are largely under the control of that one institution, both as to their wages and as to everything else, and that such a condition is hurtful to labor, because there is no competition then for labor in that given line. Suppose all the men that are skilled in refining, for instance, are employed by one institution, and a man is discharged by that institution for some fanciful reason; there is nowhere for him to go to get employment. Now, I think that is a positive injury to labor. If fifty concerns were in the business, when a man ceased for any reason to be employed by one, he could go to another. If there is only the one employer, that man is driven out of that industry altogether, and must seek something new. He can not be as profitable either to himself or to the public in any new capacity as he would be in a capacity in which he is highly skilled. Maybe he has attained such an age that he can not go into any new business; then that man's labor is lost to the world. I know of instances where a trust has discharged a man because he had had some difficulty with, we will say, the general manager of a particular plant, and the manager immediately reported that man to all the other institutions and said, "This man is not to receive employment." For a year—in the case I have in mind; I do not care to give names—he was out of employment and could not get it. That was his business; he knew it; he had been in the business for ten years; and he could not get employment in any other institution connected with that trust. Now, I think that all those questions come in; and that the trust is always hurtful to labor because, just as it controls the price of the crude product, it will absolutely control the labor in that given industry. Suppose you have a trust with regard to all industries; then there is no place for a man to go. If he is thrown out of employment, where will he go to get work? Every man ought to be able in this country, rich as it is, to have a chance for employment. So I think that in that way it affects labor. There is another way. Under these conditions men are made subservient; their manhood is to some extent destroyed. They are not the same independent class of Americans that they would be if they felt that, if they were discharged by this employer, they could go to some other and get employment. It belittles men and injures them in every way. Therefore, I think the trusts are hurtful to labor.

LABOR ORGANIZATIONS—THE STANDARD OIL COMPANY AND ITS MEN.

Q. (By Mr. Kennedy.) Do you believe that combinations such as you have been talking about make the organization of labor more logical and necessary to the welfare of the working men? A. If they do not organize and keep organized I do not know what will become of them.

Q. (By Representative Otjen.) Are the men employed in the oil industry generally organized? A.

There is an organization known as the Producers' Protective Association, organized for the purpose of protection. They have not had any meetings in recent years because they have been devoting their time to the business part of the defense of their industry. They have not had any time to look after anything else.

Q. (By Mr. North.) Are the employes of the Standard Oil Company organized into a trade union? A. I do not know. I want to say for the employes of the Standard Oli Company that, as far as I know them, they are competent, polite and a good class of men. So far as the producers are concerned, they have no fault to find with the class of men they employ to do their business. They are really good men. They have to employ that class of men.

Q. (By Mr. Kennedy.) Is it a fact that the Standard Oil Company's employes are comparatively well paid and well treated, and are always loyal to the Standard Oil Company? A. I know nothing about the question of loyalty. We have never attempted to inquire into that, but I think they are reasonably well paid.

POWER OF TRUSTS OVER THEIR MEN—THEY HAVE PAID FAIR WAGES THUS FAR.

Q. (By Mr. Ratchford.) It is claimed by a great many laboring men and labor organizations that a trust which controls a number of establishments, by reason of that large control of industry, is able to close down one or more of them in order to reduce wages or to lengthen the hours of labor or to bring about some undesirable condition for the working people and at the same time suffer no loss in their product, because they can transfer their business to some other establishment for the time being. What is your opinion on that phase of the question? I should think that would be true, for the reason that if they have a complete monopoly of the business, it does not make any difference what their output is. They can close half their establishments, and put out half the product, and double the price on it. They can put the price where they please; their is no power to control them anywhere.

Q. Have you any recollection of any instances in which that took place, or in which there is reason to believe that it was the cause of the trouble? A. No, I do not recollect any at present. Trusts have not been long in existence, except in a few instances. It was necessary for these trusts to have the good will of their employes; and they have paid them fairly good wages and have not been in trouble with their labor.

Q. It is claimed by the friends of trusts pretty generally that they treat their workmen better, pay them higher wages and grant more agreeable conditions generally than do individual employers or smaller companies. What is the truth about that? A. I think there is nothing in that.

Q. Generally speaking? A. Taking them all into consideration, I do not believe that is true.

STABILITY OF EMPLOYMENT.

Q. (By Mr. Farquhar.) Does a trust usually give more stable employment than individuals and smaller corporations? A. I think that the length of the period that they have been in existence has not been long enough to determine that question. A great many individuals and companies have had employes for ten to fifteen and twenty and thirty years. The trusts have not been in existence so long as that.

Q. Is it not usual among the employes of the Standard to say: "As long as you behave yourself and attend to your business you will stay?" Is not that always the inducement held out to foremen and others in the Standard to keep their men? A. Oh, they follow the business rule. When the exigencies of the business require it, they cut their employes without giving much reason for it. I do not know that they do that very thing; I do not charge them with that.

TRUSTS DISPLACE LABOR.

Q. (By Mr. C. J. Harris.) When they dismantle a factory, what becomes of the men that have worked there? A. They find some other employment if they can.

Q. (By Mr. Ratchford.) To what extent, if any, does the operation of the trust displace men—traveling salesmen, foremen, or superintendents; labor of any kind? A. I think it very largely displaces labor, but I do not know that it decreases the cost, because I think they add to the salaries of men that are in charge. They pay very high salaries to leading men. I think that the liberal payments, instead of being given to a number of men, are given to one or two, and they cut the laboring forces. I think it would do away with a great many traveling men, because the trust can fix their own price, and people must come and pay it.

Q. You seem to be pretty positive that labor is displaced in the operation of a trust? A. I have not a bit of doubt of it.

Q. (By Representative Livingston.) Has the Standard Oil Company done any reducing of the wages of their employes in years gone by? A. They did, during the depressed period, reduce wages.

Q. During what period? A. During the panic of 1893, and subsequent to that. Probably not more than others; I do not know about that.

THE INDEPENDENT REFINERIES ARE INDEPENDENT.

Q. (By Mr. Jenks.) Do the different companies of your organization work together in harmony? A. Yes.

Q. Have you been able in your organization, since you came together and are working in harmony, to dispense with the labor or services of many of your higher priced men, your traveling men, and so on? A. We never have employed any traveling men in this country. The refineries are all independent;

they are not at all connected with our companies. Each refinery is an entirely independent concern. They simply buy oil from us, and we buy oil from them, just as we would buy it from anybody else.

Q. (By Mr. Phillips.) Do they own stock in these pipe lines? A. They own stock in the various pipe lines, and also in the Pure Oil Company. While they own stock, they own their refineries independently. There are the Independent, the Penn, the Continental, the Germania, the Crystal, the America, the Emery Manufacturing Company, the Columbia, and the A. L. Confer; they all own their plants. Sometimes two or three persons own one. In the Independent Refining Company, I think, there are only three persons; in the Continental I think there are but two. There are several others owned by one or two persons, and they are all independent.

RELATIONS OF THE REFINERIES TO THE INDEPENDENT COMPANIES.

Q. (By Mr. C. J. Harris.) Your companies do not pretend to be a trust, do they? A. Oh, no; we are trying to keep away from trusts as far as we can.

Q. (By Representative Livingston.) If I understand, each of these independent companies owns stock in the general company? A. Yes; in the United States Pipe Line Company, and also in the Producers and Refiners Oil Company, Limited.

Q. And you view that pipe line as the agent of those other companies? A. No; as an independent company in which various persons own stock. The companies stand each on its own footing as to dividends.

Q. Who pays the incidental expenses of this independent pipe line? A. The company itself. It charges 15 cents for local pipage to the refiners. They have 15 cents' pipage to pay the expenses, and if anything is left, that is the profit.

Q. (By Mr. Phillips.) Was there or was there not a movement on foot to unite the various pipe line companies and the refineries? A. There have been suggestions of that kind. It has been thought that we should be stronger if we were united into one organization.

Q. (By Representative Livingston.) You charge 15 cents for piping, and out of that you pay all your current expenses? A. Yes.

Q. You have a monopoly on that; you are a kind of a trust, are you not? A. No; the Standard is competing with us in the fields we are in; they rob us of that feature, I should think. Ten per cent. could hardly be claimed to be a monopoly, and we are not 10 per cent. even; we are about five.

Q. (By Mr. Phillips.) If these various companies became united, should you be willing, as an officer in each one of the four, to submit to thorough inspection of the books and accounts, and the profits that such an organization might make? A. We should be very glad if the government would inspect us and everybody else; we should be glad to suffer an inspection in order to have some other people inspected.

SOME REFINERIES HAVE AGENTS—THE MOST OF THEIR OIL IS SOLD THROUGH MERCHANTS.

Q. (By Mr. Farquhar.) How do these independent companies put their burning and lubricating oils on the American market? A. Each refining company markets its own oil. They get orders, and some of them have stations. For instance, one company I know has a station at Rock Island, Ill., and one in Chicago; and through these stations it markets almost all its refined product.

Q. Have these independent companies permanent agencies for the sale of their oil? A. Some of them.

Q. Or do they drum for their custom? A. Some of them have permanent agents in certain places, shipping the oil to them and having facilities for storing it.

Q. Do you know whether the greater part of their product is put into the field through their own agents or through other oil houses in those cities? A. I presume that the greater part of their product that is marketed in the United States is sold through merchants or others who are in the business.

QUALITY OF THE PRODUCTS OF THE STANDARD OIL COMPANY AND THE INDEPENDENTS.

Q. That being the case, the Standard Oil Company and your independent companies come into open competition there for the market? A. Certainly.

Q. Do you know of any better qualification for the sale of oil, independent of monopoly, than the quality of the oil and the prices? A. The quality undoubtedly should affect the price.

Q. The Standard Oil Company, coming in with a better quality of oil and selling at an equal price with the other, would limit the field? A. If they made a better quality of oil.

Q. I say, presuming that they do; I made the question in that way. A. Well, but they do not.

Q. Is it not a fact that no company, whether a monopoly or not, can hold the American market unless it sells a better oil at an equal price? A. No; I should not say that would be true, absolutely.

RAILROAD FAVORITISM.

Q. You said this morning that some of the railroads have taken the buying of lubricating oil out of the hands of the purchasing agents, and that the oil is bought by one of the officers—the vice president or the president of the road. Is it not a fact that in the economy of the equipment of the railroad, if you ran a poor lubricating oil you would lose by it more than the little cent or two that you might save on the gallon? A. Undoubtedly.

Q. Would it not ultimately ruin the machinery and ruin the road? A. Yes.

Q. Without any favoritism question to speak of in the selling between these people? A. I would not say that.

Q. Do you not think that years ago, while favor-

itism did prevail in purchasing lubricating and burning oils on railroads and among large consumers, there was a favoritism and a large one, and that now the economy of railroads is such that even in their stationery and printing, where management used to be left with local agents and division superintendents, it is now concentrated in one head or function in the management of the road? Isn't it the same with the purchase of oil? A. No; I think oil is made an exception.

Q. You do? A. Yes.

Q. Can you deny that while temporarily the advantage might be given, for personal reasons, to the men who canvass, or to the company that offers to sell the oil, in the course of a year or two, the best product will stick—that is, at an equal price with any other? A. That would be true if they were looking solely to the interest of the road; but if they had some ulterior purpose in purchasing, it would not be true.

Q. I am discussing the purely business proposition. A. As a purely business proposition that would be true; and if a man was doing it for himself, it would be all right.

Q. So there is no monopoly that can be held in any product, in the United States or anywhere else, as long as you put the product or article on the market at an equal price? A. I do not think that is true.

Q. Why is it here, in textiles and things of that kind that this country produces, that the product is the finest? And will they not hold the market for years against all other producers? A. That may be true. It ought to be true always, but I am afraid it is not.

Q. (By Representative Livingston.) Do you sell your oil in States where they have an oil inspector? A. Yes.

Q. You have no trouble with the laws of Georgia? They have an inspector, and you sell your oils there without let or hindrance? A. Yes.

Q. Does the Standard? A. Yes.

Q. They are supposed to stand the same test. A. All have to. I think that with the general public they are on an equal footing. So they are to a large consumer that is purchasing for himself; but in the case of an officer of a railroad, there may be some reason why he wants—

Q. To shut out? A. To shut out competitors in favor of them.

Q. But that is a good business reason, isn't it? A. Not always, I am afraid.

Q. Usually? A. I do not think it is usually.

Q. Would you not try to gain the European market, to shut them out of it by putting down the prices in Europe? A. I think they could purchase just as good oil for one-half the price they are paying. If that is the case, your argument would not hold.

FREIGHT REBATES.

Q. In reaching the market—I use the State of Georgia as a mere illustration—in reaching the market in Georgia, what advantages are granted to the Standard Oil Company over your companies? Any? A. Yes, we think so.

Q. In the way of rebates? A. We think so.

Q. Have you established that? A. It has been established in a number of cases; yes.

Q. Brought to your attention? A. In Georgia? No, sir.

Q. Well, I only used that as an illustration. Has it been brought to the attention of the Interstate Commerce Commission? A. Oh, yes; and they have assessed damages for that freight discrimination.

Q. They have collected it? A. It is in process of collection now; they are still fighting.

Q. (By Mr. Farquhar.) I think the commission would be much obliged if you would furnish it with the names of these cases that have come into court, where there was sworn evidence to sustain these allegations, where they occurred, the defense made, and whether cases are now in process of litigation. A. I will do that.

NONE OF THE PRINCIPAL RAILROADS BUYS LUBRICATING OIL FROM THE INDEPENDENTS.

Q. (By Mr. Phillips.) Do any of these independent refiners secure a market for lubricating oil on any of the principal railroads of the United States today, or could they if united? A. They do not now, and I doubt whether they could if united. It is a very doubtful question.

THE INDEPENDENTS REFUSE TO SELL OUT TO THE STANDARD OIL COMPANY—THE REASON.

Q. (By Mr. Kennedy.) Would you state as your belief, judging from the experience of the past, that the Standard Oil Company would, if it could, tomorrow purchase all these refining companies, paying for them more than their real value? A. I do not know whether they would do that now or not. They have offered to do it in the past. They made that offer in the fall of 1894 and in January, 1895.

Q. Do you believe that if such an offer should be made the independent companies would refuse it? A. I think they would. They have done it.

Q. So then the public must suppose that the independent companies have a good thing in the way of business? A. No, that doesn't follow. The people who are interested in these pipe lines have a very large interest at stake in their producing properties. They own about 75 per cent. of 80,000 barrels of oil a day; in other words, 600,000 barrels of oil a week. That amounts in a year to about 20,000,000 barrels of oil. We believe that the price of that oil is largely dependent upon having an open competitive market for refined oil. Their pipe lines will give them an open competitive market, and therefore they would not give them up. They had rather have them wiped out, if they must be. We were at a point where we expected them to be wiped out; but we were willing to suffer that rather than to sell them. We passed an act of the legislature that we could not sell them, and nobody could sell them,

but they got that repealed. The Standard had that repealed, and a little while afterwards it purchased the Crescent pipe line. That law, prohibiting independent pipe lines from consolidating, was passed in 1883, at the same time when the free pipe line law was passed. That continued to be the law until 1895, when the Standard Oil Company secured its repeal. They had got a bill passed to repeal it two years before, but the governor of Pennsylvania at that time vetoed the bill. They got the repeal bill through again in 1895, and the governor signed it. So that the independent people who secured the passage of this bill were like Cortez when he went to Mexico. They were willing to burn their ships, and either stay in Mexico and fight it out or fall.

THE INDEPENDENT ORGANIZATION INCLUDES THE OWNERS OF 40 OR 50 PER CENT OF CRUDE PETROLEUM.

Q. (By Mr. Jenks.) Did I understand you to say that about 75 per cent. of the producing capacity of the Pennsylvania oil field was in your organization? A. No; about 75 per cent. is owned by independent producers, not affiliated or associated in any way with the Standard Oil Company; some of them are not our stockholders.

Q. About what per cent of the oil producing fields do you have in your organization? A. I think possibly about 40 or 50 per cent.

Q. (By Mr. Phillips.) That is, stockholders? A. Yes.

Q. But the lines themselves do not own anything? A. No, the lines themselves do not.

IN THE LONG RUN, THE PRICE MUST BE HIGH ENOUGH TO PAY THE LEAST FORTUNATE PRODUCER WHOSE OIL IS NEEDED TO SUPPLY THE MARKET.

Q. (By Mr. Ratchford.) Speaking of the advantages of the larger concern, I want you to make a comparison as to the large and small producers. We will suppose, for instance, that A has oil wells producing 10 barrels per day, B producers 10,000 barrels per day; how can A compete with B in the open market? A. He cannot; but he ought to have an equal chance, for that very reason.

Q. The cost of developing a well is about the same whether it flows or whether it is dry? A. Yes.

Q. Is not the advantage of B over A as great as the Standard Oil Company over B? A. You are comparing the manufacturer with the producer.

Q. Admitting that A produces 10 barrels per day and B produces 10,000, are the advantages of B over A as great as the advantages of the Standard Oil Company over B, as the larger producer of the two? A. I do not see how you can make that comparison. You are comparing two entirely different things; you are comparing the manufacturer with the producer and one producer with another.

Q. The point I wish to bring out is simply this: Inasmuch as the cost of boring a well is the same, or nearly the same, whether it yields much or little, the individual who is fortunate enough to make a good strike, with a few additional laborers to run it, can handle 10,000 barrels as cheaply as the man who is not so fortunate handles, perhaps, only 10 or 100 barrels; and because of his greater output he can, if he will, sell at a smaller margin of profit. A. He can; but the price is usually fixed by the man who has the smaller well, for this reason: If he does not get a price that returns him at least the cost of production, he must quit. The price may not be fixed, if it is fixed arbitrarily, at a price which enables him to live. But if it enables a man who produces 10 barrels a day to live, the man who produces 10,000 per day from a small number of wells is simply getting a fortune.

Q. I understand you to say the small producer fixes the price? A. No; but the price must be fixed so that he can produce, or the small well must be abandoned.

Q. Is that price fixed by mutual arrangement? A. No, it is fixed arbitrarily by the Standard Oil Company.

MOST OIL COMES FROM VERY SMALL WELLS.

Q. (By Mr. Phillips.) Is it or is it not an ascertained fact that the greater part of the production is coming from small wells and the greater number of small producers? A. Over a majority of that production is from wells that produce less than half a barrel a day.

THE REMEDYS FORBID DESTRUCTIVE COMPETITION.

Q. What is your idea as to the remedy? A. That is a very difficult question. I want to be understood as giving simply my own view of it. The most difficult thing is to find a remedy for the evil.

Q. (By Representative Livingston.) It is no trouble for a man to know he is sick. A. No; you can diagnose the case a great deal better than you can apply the remedy. I suppose the real evil ought to be reached. The real evil is not so much in the aggregation of capital. No one objects to a man being rich, if he acquires his money honestly. No one objects to his engaging in business. We object to his driving others out of business, and doing it by the use of unfair methods. No one objects to large aggregations of capital engaging in business, if they do it fairly and honestly, and are willing to enter into fair, honest competition. I would try, if possible, to prevent them from abusing their power. I would make it a criminal offense: say, in a few words, that any person or corporation that engages in destructive competition shall be guilty of a misdemeanor and be punished with fine and imprisonment both.

Q. (By Mr. Farquhar.) You mean that as a national or State law? A. We could not apply a national law except to inter-state commerce. It would have to be a State law where it concerned commerce within the State.

Q. How would you define "destructive"? A. I would leave that to the courts and juries; they will find a way out. That is the question of intent;

and that always enters into a criminal offense. If a man starts to sell a product, not for the purpose of getting a market for his goods, but to drive somebody else out of the business, that is destructive competition. Let the jury find that intent from the evidence. Let them find it from the price, if they please. If the price is away below the cost, and they maintain that price for a long period, not just for a single sale, that is destructive competition. That is a crime—one of the highest crimes; nothing in this country has done so much damage in recent years as destructive competition, entered into deliberately. It is one of the most deliberate offenses that can be committed. No man need engage in it; he can easily avoid the penalty by avoiding the crime. That is one way.

LIMIT THE CAPITAL OF MANUFACTURING CORPORATIONS TO $1,000,000.

If I had the doing of it, I would never charter a corporation, except for public purposes, with over $1,000,000 capital. That is large enough in any business to secure a perfect division of labor. I think that ought to be the limit of commercial companies. There is not much danger in this country from a company with $1,000,000 capital. One man said to me: "This is our business. I can lose $100,000 and spread it over half a million and not feel it. Your company cannot lose $100,000; it does not have it to lose; we will drive you out of business.

AS TO QUASI-PUBLIC COMPANIES, REGULATE THEIR CHARGES.

Q. (By Mr. A. L. Harris.) Would you include transportation companies in that bill also? A. No, I would call that business public or quasi-public. I think that all telegraph companies, all electric light companies, where they are in cities or where they deal directly with the public, all traction companies, should be under severe regulation. The price of those goods can be regulated because they have a fixed unit. Fix the price of the thousand cubic feet of gas. Fix the fare for the carriage of passengers. You have no way of getting at a commercial company. If you can limit their capital to $1,000,000, you will have a remedy. If you do not do that, you must do something else, or else the country is going to be ruined by these large aggregations of capital.

NO ANTI-TRUST LAW CAN BE OF SERVICE, UNLESS IT LIMITS THE SIZE OF CAPITALS, OR MAKES DESTRUCTIVE COMPETITION A PENAL OFFENSE.

Q. Would you reach the trouble better by what is commonly called the anti-trust laws, or in the corporation acts of the different States? A. They would have to be real anti-trust laws; you would have to say that no company should have more than $1,000,000 capital. You can have a perfect division of labor with $1,000,000 capital; and all political economists say that is all that is desired by the aggregation of capital. That is not what the trust desires. The trusts desire to get into position to squeeze somebody; drive somebody out of business; whereby they can levy tolls on the public generally. That is what the trusts are for.

Q. (By Representative Livingston.) You recommend State laws controlling and regulating trusts; what would you recommend us to do with the State of New Jersey, that starts them? A. I do not know what you could do with the State of New Jersey. I do not suppose that any legislation could be secured in New Jersey This will probably have to be reached by securing a healthy public sentiment first.

Q. If one State in the Union is allowed to issue charters just as she pleases, and do as she pleases, those charters are operated in all the other States, how are you going to legislate? A. You could say in the State of Georgia that no trust should be possible in that State. Suppose a dozen States should pass laws that no trust should be possible or no corporation should do business in those States with a capital of over $1,000,000; that it would enable independent companies to go in and do business in those lines. I do not object to the amount of capital. I only limit it to $1,000,000 because a company with $1,000,000 capital cannot engage in destructive competition. It might be mean in a small way, but it could not do much damage. A company with $100,000,0000 or $500,000,000 capital can drive everybody out of that business; and the question is, Will they not do it? There is no way of curbing their power except by restricting their capital, or else making it a penal offense to engage in destructive competition.

THE DUTY ON OIL IS PERHAPS MEANT TO PROTECT THE FUTURE.

Q. Have we any import duties on oil? A. Yes; there is an import duty of 10 cents a barrel.

Q. How does that help? A. There is no oil imported into this country. It does not help anybody, because there is no oil imported.

Q. Does not keep anybody out? A. No one.

Q. Why is it put on? A. I do not know; for the protection of the future, perhaps.

OVER-CAPITALIZATION LEADS TO EXCESSIVE CHARGES.

Q. In addition to large aggregations of capital, is not the public also in danger of overcapitalization? A. Undoubtedly. Having overcapitalized these trusts, they will want to show an earning power to the holders of stock; and in order to do that they must collect extortionate profits from the consumer if they have a monopoly. That will tend to drive the directors or trustees of these trusts into obtaining from the public excessive profits.

Q. (By Representative Livingston.) Do not all overcapitalized organizations go into bankruptcy inevitably? A. I think a great many of them will.

TRUSTS KILL INDIVIDUAL ENTERPRISE

Q. (By Mr. Ratchford.) What effect, in your judgment, has the organization and operation of trusts and the large moneyed corporations upon the personal ambition, the individual enterprise of the American people? A. I think it is very rapidly stifling it.

Q. Could you state whether or not, in your judgment, large numbers of individuals are kept out of business by reason of those things? A. No question about it.

Q. You spoke of destructive competition; can you conceive of any way in which that destructive competition could be brought about more forcibly and more fully than by the tearing down and destroying of the rival establishments? A. No; I do not know a more flagrant means of destroying competition than by paying exhorbitant prices for competing plants in good condition and tearing them down. That's a notice to everybody that they do not propose to have competition.

Q. That probably works great hardship to communities in which these plants are torn down? A. Undoubtedly; it is a waste of that much capital, which it has taken years to build up. If a man burns his own home he is guilty of arson; if he destroys a new plant out of mere animosity and desire to injure some one else, I do not know why he should not be guilty of an offense.

INCOME TAXES AND INHERITANCE TAXES.

Q (By Representative Livingston.) Instead of preventing combinations of over a million dollars, as you suggested, suppose you levy an income tax of 50 per cent on the profits? A. I am afraid they would lie about the profits.

Q. Would not that be a fairer way to do it? A. I would be willing to do anything to wipe them out and give the people a fair chance. I think that would do the work if you could enforce it.

Q. (By Mr. Farquhar.) Would any State or court regard that as constitutional, or any European court? A. have no hostility to any individuals. I simply would like to see some limitation put upon the powers of trusts in the interest of the people themselves.

Q. (By Representative Livingston.) It would not be class legislation if Congress should lay a tax on the incomes and profits of all trusts and combinations? A. I should dislike to see any law passed that would recognize their existence.

Q. (By Mr. Phillips.) What would you think of an inheritance tax, levied in some graded proportion to wealth? A. I am afraid that would be open to objection, unless it is uniform; and if it were uniform it would be avoided very largely, would it not, by people making gifts prior to their death?

GOVERNMENT VISITATION DESIRABLE BUT NOT SUFFICIENT.

Q. (By Mr. Farquahar.) Have you any other remedy for destructive competition than the limitation of capital to $1,000,000? A. Government visitation might alleviate the evil, but that would only result in publicity. They do not seem to care much about that; they are largely defying public opinion.

Q. (By Mr. Phillips.) Would you be in favor of government inspection of corporations? A. I think that ought to be done; the power of visitation was a common-law right in England to the founder of a corporation. He had the power of visitation, and as the State creates the corporation it certainly should have the power of visitation. It has an undoudted right to do it.

PRACTICABILITY OF PUNISHING DESTRUCTIVE COMPETITION.

Q. (By Representative Otjen.) If you make destructive competition a criminal offense, how would you enforce the penalty against corporations? A. I would make it apply to any person, corporation, or agent of a corporation. You cannot imprison a corporation, but the fine would apply to it.

Q. You would simply have to enforce the penalty in the shape of a fine? A. Make all officers guilty of the offense. They are willing to risk anything, violate any moral obligation or rule; but there is one thing they do not like to do—they do not like to take any risk of imprisonment.

Q. It would be competent to fine a corporation found guilty of destructive competition, but would it also be competent to imprison the president or directors? A. The law can say that any corporation, and all the officers thereof, and all the agents or employes connected with the corporation engaged in the destructive competition, shall be guilty of a misdemeanor, and on their conviction shall be fined $500 and undergo imprisonment of one or two years in the penitentiary.

Q. (By Mr. Ratchford.) Do you believe the law should define exactly what destructive competition means? A. Leave that to the courts and juries.

THE SHERMAN ANTI-TRUST LAW. THE INTER-STATE COMMERCE COMMISSION.

Q. (By Mr. A. L. Harris.) Have you any suggestions to make as to amendments that would make the Sherman anti-trust law more effective than it is now? A. I have not, at this time; I would like to look that over again.

Q. Will you please do that and see whether it can be made a basis for a future remedy? A. I think the law has had some good effects.

Q. Is it possible to bring it under the jurisdiction of the Inter-State Commerce Commission in any way? A. That is a pretty difficult question. That

is a question a great many people have considered; I have been thinking of these questions for perhaps thirty years. I have been brought into pretty close contact with them for that period.

THE OIL TRADE IN CANADA.—RAILROAD DISCRIMINATION THERE.

Q. (By Mr. Jenks.) Do we export oil to Canada? A. Yes; we sell a great deal there.

Q. Does your company sell any in Canada? A. Yes.

Q. Have you come in contact there in any way with discrimination in railroad rates? A. There has been conflict there. There has been trouble about railroad rates there recently.

Q. Has your own establishment come in contact with that? A. Yes; I think they have.

Q. Can you give the facts about that? A. No; I do not believe I can now.

District of Columbia, County of Washington, ss.::

I swear that the statements made by me of my own knowledge in the foregoing report of my testimony before the Industrial Commission are true, and that all other statements I believe to be true.

J. W. LEE.

Sworn and subscribed before me this 9th day of September, 1899.

WM. CALVIN CHASE,
Notary Public.

Washington, D. C., May 16, 1899.

TESTIMONY OF HON. FRANK S. MONNETT.

Attorney-General of Ohio.

The commission met at 10.50 a. m., Vice-Chairman Phillips presiding. Hon. Frank S. Monnett, attorney-general of the State of Ohio, testified.

Q. (By Mr. Jenks.) Will you be kind enough to state your full name and address? A. Frank S. Monnett, Columbus, Ohio.

Q. You hold the position of attorney-general of the State of Ohio at the present time? A. Yes.

Q. In the carrying out of your official duties have you found it necessary to bring suits against some of the great industrial combinations? A. Yes.

SUITS FILED BY THE STATE OF OHIO AGAINST INSURANCE COMPANIES.

Q. What ones in particular? A. We filed the first suits against eleven insurance companies, which included British, Canadian, and American companies, charging them with being in a state combination through local boards, or through a communication between local boards, amounting to a state organization; and also with being in an interstate combination at Chicago through a state organization. These cases have been pending, and are now in the hands of the court with 800 pages of printed testimony of the various witnesses. If the members of your commission care to have any of them, we can furnish you with the official copy of the testimony, and from that you can get the names of such witnesses as are available on the lines you want.

SUITS AGAINST THE STANDARD OIL COMPANY OF OHIO.

The next suit that we had was the State of Ohio ex rel. attorney-general against the Standard Oil Company of Ohio, which, I believe, has been pending since 1891. A decree was rendered March 2, 1892, against the Standard Oil Company of Ohio, it having been charged with being a member of the Standard Oil Trust, or being one of the constituent companies of the Standard Oil Trust. By an order of the supreme court of the State in November, 1897, I was directed to bring it (the Standard Oil Company of Ohio) before the court for contempt, charging it with having violated the decree rendered March 2, 1892, in not withdrawing from the trust in good faith, but in simply shifting or modifying the former system of doing business, so as still to get the benefits of the trust combination or arrangement. In accordance with that order from the supreme court I filed a complaint in contempt, a copy of which I will furnish your commission, to which complaint the court gave an order for service upon the defendants, and the defendants thereupon came into court with an answer attempting to justify their conduct subsequent to the decree, to which answer we filed a reply with some twenty-nine interrogatories addressed to the president of the Standard Oil Company, who is also the chairman of the liquidating trustees, and also the chairman of the former nine trustees of the Standard Oil Trust, Mr. John D. Rockefeller, of New York, formerly of Cleveland, Ohio. Mr. Rockefeller answered these printed interrogatories under oath in part and demurred to part, which, under our code, he had the right to do, and part he refused to answer on the ground that they were irrelevant.

The court overruled the demurrer or the refusal to answer the main interrogatories; that was objected to, and they then came into court with a supplemental list of answers. Thereupon we took additional—rather, Mr. Rockefeller's—testimony in the way of depositions under a master appointed, and of that testimony I will give such data as your commission desires. In their testimony, as disclosed by the interrogatories, and by Mr. Rockefeller in person, and the secretary, F. B. Squires, of Cleveland, we were able to find data that warranted the State in filing suits against such constituent companies of the original trust as were doing business in Ohio.

SUITS AGAINST CONSTITUENT COMPANIES OF THE STANDARD OIL TRUST.

We filed independent suits against The Buckeye Pipe Line Company, a constituent company, which is the transporting company of the crude product; against The Ohio Oil Company, known as the "producing" company, which makes leases or contracts with the owners of oil in the rock, usually farmers; against The Solar Refining Company, which has functions substantially the same as the Standard Oil Company of Ohio, which is a refining company; and against The Standard Oil Company of Ohio, anew.

FOUR CAUSES OF ACTION.

In these suits substantially four causes of action were made. In the first instance we charged them with violating the public policy of the State, our procedure being based upon the constitutional right of the attorney-general to institute proceedings in quo warranto against any corporation that offends against the existing statutes of the State or against the public policy of the State, and with confederating and attempting to evade the decree of the supreme court in the decision of March 2, 1892, against the Standard Oil Company proper.

DOING A TELEGRAPH BUSINESS.

The second cause of action was based upon what is known as our "anti-trust act," the Valentine-Stewart act, which was passed a year ago and took effect July 1, 1898. On taking the testimony at Lima, Ohio, in the case of The Buckeye Pipe Line Company, it was disclosed that they had a telegraph system, which, from a lawyer's standpoint, it was conceded, a company, doing a business of the nature they were, might have as an incident to their business, being a means of communication between their different posts; but in the testimony it was disclosed that they were exchanging business with the Western Union Telegraph Company, had stated monthly balances, and were acting as common carriers of telegraph messages in Ohio for whosoever applied to them. It was testified that they had produced election returns and other news in advance of the regular system. As they were exercising this franchise outside of their corporate authority, we make it an additional cause of action against them, charging them with exercising this ultra vires power. We have taken testimony to establish this, which I can furnish the commission. Under the Ohio law it would be necessary for them to have a special charter for that class of business.

It was disclosed and is in evidence, as claimed by the State, that in relationship existing between the constituent companies (to which I will refer later), there were separate telegraphic contracts for the Ohio Oil Company, the Buckeye Pipe Line Company, and the Solar Refining Company, differing from the contract they had with their customers or the public generally. They used the Western Union blank contract for the ordinary telegraphic service, but had a separate contract and a separate account with each of these constituent companies, raising the legal presumption, as we claim, from the evidence, that they have a system organized about as follows:

THE ORGANIZATION OF THE BUSINESS DESCRIBED.

They have a purchasing or "producing" company, the Ohio Oil Company, which makes the original contract with the owners. The oil is then turned over to the Buckeye Pipe Line Company, known as "the crude product" company, which, in conjunction with the other pipe line companies, owned by Standard people, makes a complete system, and which, as we understand it, constitutes a single system, the Buckeye Pipe Line Company having the Ohio field, but doing business in Indiana also, which, subsequently to this suit, they turned over to the Indiana Pipe Line Company, also one of the constituent companies of the original trust combination. Then from the "crude product" or transporting department, with its telegraphic system, connected with all departments and all pipe lines, the oil is transferred to the respective refineries which are at Whiting, Ind., a suburb of Chicago, at Cleveland, Ohio, at Lima, Ohio, and at Parkersburg, W. Va.

The Buckeye Pipe Line Company delivers the crude oil to the refineries. The refined product, the kerosene and the gasoline, is transported to dealers and customers through another constituent company, the Union Tank Line Company, which has a system of tankage stations, i. e., distributing points such as county seats, and cities of from 3,000 to 5,000 inhabitants and upward. They have contracts with railroads, which you can go into more fully than we have, and which will disclose the nature of the relationship to the railroads. This company gets a rate for their tank line, in shipping to the tank stations by the carload or train load, with an allowance for loading and unloading their own product, while for barrel lots and part carload lots the rates vary. According to the trust investigation of Ohio the charges for shipping by part carload lots are as much as 400 per cent of the charges for shipping in carload lots and delivering at tank stations by the Union Tank Line.

THE POWER OF THE TRUST DEPENDS UPON ITS CONTROL OF THE TRANSPORTATION SYSTEM.

The State claims this whole system of transportation to be an advantage which the Standard Oil Companies have as shippers, and by means of which they defeat competition. In other words, the secret of the power of the Standard Oil Trust will be found to be the discriminations or favors that they secure by controlling or monopolizing the transportation of the crude product and the discriminations they receive by various devices in transporting the refined oil, e. g., the discriminating rate in favor of

carload lots and train loads, with allowances for loading and unloading their own product. When other shippers adopt similar methods, the Standard invents still other methods to evade fair competition

Q. You understand this discrimination to be, in spirit at any rate, a violation of the inter-state commerce act? A. The inter-state commerce act applies to inter-state commerce; I refer to State commerce, namely, to Ohio and Ohio roads. On examination you will find the railroads are permitted to give a different and more favorable rate for carload lots or in tanks than in barrels. The argument that they adduce is that the return of gasoline barrels contaminates all other shipments; that they can not ship any other freight in such cars. If you examine the freight charges in cases where a competing pipe line has been constructed along a railroad, that formerly had a fixed rate, you will find that instead of the competitive pipe line which parallels the railroad lowering the price, it has absolutely raised it, showing that the independent shipper is discriminated against. He can not compete because rates have been raised, and he must pay their price if he ships through the pipe line.

ORGANIZATION OF THE TRUST.

Starting with the Standard Oil Company of Ohio, shall I explain how it entered the trust, and give the names of the other constituent companies, with the capital stock of each?

Q. Have you also the dates of the organization of these different companies, with the names of the leading officers? A. Yes; I can furnish them. The Standard Oil Company of Ohio was organized originally the 10th day of January, A. D. 1870, and is commonly known as The Standard Oil Company. It had $1,000,000 stock. It increased that stock the 12th day of February, A. D. 1872, to $2,500,000. On the 13th day of March, A. D. 1875, it increased its capital stock by State authority to $3,500,000. It remained in this condition from 1875 to the 2d day of January, A. D. 1882. It had 35,000 shares of stock at a par value of $100 a share, which would make the par value of the total $3,500,000.

Mr. Rockefeller's testimony is ambiguous as to whether they transferred the stock directly to the Standard Oil Company of Ohio first, or whether, as owners of the stock, they transferred that to the trustees of the Standard Oil Trust; but in any event all the stockholders agreed to the trust contract of 1882. Two days afterwards they modified it. The company in Ohio had originally 9 directors of the Standard Oil Company and they were afterwards reduced to 7; the 7 continued to vote the 9 shares. The theory of the Standard Oil Company was that a corporation could maintain its existence by 7 directors holding each a share of stock. They did this to comply with the statute. Seven directors could elect a president and secretary and necessary officers, and the remaining stockholders would be at liberty to assign their stock to trustees. Other companies did the same, thus organizing and maintaining a trust. In other words, they argued the corporation would not be responsible for the acts of the individual stockholders, and that theory ran through the entire organization of the trust; viz: that stockholders could act independently of the corporation. The suit was begun by my predecessor, General Watson. The 34,993 shares had passed out of the hands of the stockholders into the hands of the 9 trustees.

THE CONSTITUENT COMPANIES.

There were three classes of companies that entered into the combination. First, they had all the stockholders and members of the following 14 companies: The Acme Oil Company (New York); Acme Oil Company (Pennsylvania); Atlantic Refining Company of Philadelphia; Bush & Co., Limited; Camden Consolidated Oil Company; Elizabeth Acid Works; Imperial Refining Company, Limited; Charles Pratt & Co.; Paine, Ablett & Co., Limited; Standard Oil Company (Ohio); Standard Oil Company (Pittsburg); Smith Ferry Oil Transportation Company; Solar Oil Company, Limited; Stone & Fleming Manufacturing Company, Limited. All the stockholders and members of these corporations and limited partnerships were required to sign an agreement to turn in their stock (except enough to preserve State organizations), as I have explained to you. A second class of companies consisted of the interests of W. C. Andrews, John D. Archbold, and a long list known as the individual owners, who signed the original trust agreement. A third class consisted of corporations, 25 in number, which assigned a controlling interest in the companies to the trustees. They were: The American Lubricating Oil Company; Baltimore United Oil Company; Beacon Oil Company; Bush and Denslow Manufacturing Company; Central Refining Company, of Pittsburg; Chesebrough Manufacturing Company; Chess-Carley Company; Consolidated Tank Line Company; Inland Oil Company; Keystone Refining Company; Maverick Oil Company; National Transit Company; Portland Kerosene Oil Company; Producers' Consolidated Land and Petroleum Company; Signal Oil Works, Limited; Thompson & Bedford Company, Limited; Devoe Manufacturing Company; Eclipse Lubricating Oil Company, Limited; Empire Refining Company, Limited; Franklin Pipe Company, Limited; Galena Oil Works, Limited; Galena Farm Oil Company, Limited; Germania Mining Company; Vacuum Oil Company; H. C. Van Tine & Co., Limited; and Waters-Pierce Oil Company. These 39 companies, with the long list of individuals, are all that entered into the original Standard Oil Trust. The respective stockholders, partnerships, and individuals, on an appraisement agreed upon, received new trust certificates for their proportionate interests in the stock or assets transferred to the trust.

APPRAISEMENT OF THE BUSINESS OF THE CONSTITUENT COMPANIES.

Q. Will you tell us, first, how this appraisement was made and what its basis was? A. Well, the consideration for the transfer and conveyance of

the money, property, and business of each of the Standard Oil Companies was trust certificates of the Standard Oil Trust, issued by the trustees of the trust, equal in par value to the appraised value of the money, property, and business so transferred. The stock was to be delivered to trustees provided for in the trust agreement and their successors, and no stock was ever to be issued by any of the contracting companies except for money, property, or business equal at least to the par value of the stock so issued, nor was any stock issued by any of said companies for any purpose, except to the trustees herein provided for, to be held subject to the trusts hereinafter specified. There was not any watered stock. They entered the trust at the actual appraised value; the appraisers were interested men, and it would have been of no advantage for them to inflate it. They attempted to get actual value, an on that basis they issued trust certificates.

Q. Probably the selling value at ordinary sale? A. It was placed on the income value—its selling value. The trust agreement provided for 9 trustees to be elected. The first three were John D. Rockefeller, O. H. Payne, and William Rockefeller, and they were elected to hold office until the first Wednesday of April, 1885. The next three were J. A. Bostwick, H. M. Flagler, and W. G. Warden, to hold office until the first Wednesday of April, 1884; and the next three, Charles Pratt, Benjamin Brewster, and John D. Archbold, to hold office until the first Wednesday of April, 1883. The trustees were thus a continuous body. In the beginning there was one-third for 3 years, one-third for 2 years, and one-third for 1 year, who held office until their successors were duly elected and qualified. The 39 original companies were subsequently merged into 20 companies. A list of the 20 companies and the capital stock, the nominal capital stock as they now exist, is about as follows:

Companies	Appraised value	Capitalization
Anglo-American Oil Co., Limited	$ 6,913,639 49	$ 5,000,000
Atlantic Refining Co	8,631,376 67	5,000,000
Buckeye Pipe Line Co	7,941,038 15	10,000,000
Eureka Pipe Line Co	1,547,055 16	5,000,000
Forest Oil Co	3,528,813 11	5,500,000
Indiana Pipe Line Co	2,014,053 91	1,000,000
National Transit Co	25,796,712 97	25,455,200
New York Transit Co	4,999,300 00	5,000,000
Northern Pipe Line Co	707,067 00	1,000,000
Northwestern Ohio Nat. Gas Co.	1,396,760 00	3,278,500
Ohio Oil Co	8,260,378 04	2,000,000
Solar Refining Co	711,793 87	500,000
Southern Pipe Line Co	3,279,018 28	5,000,000
South Penn Oil Co	3,021,654 87	2,500,000
Standard Oil Co., Indiana	1,038,518 61	1,000,000
Standard Oil Co., Kentucky	3,604,800 78	1,000,000
Standard Oil Co., New Jersey	14,983,943 30	10,000,000
Standard Oil Co., New York	16,772,186 29	7,000,000
Standard Oil Co., Ohio	3,426,014 72	3,500,000
Union Tank Line Co	3,057,187 41	3,500,000
	$121,631,312 63	.....
Capitalization 20 corporations	102,233,700 00	.....
Excess	$19,397,612 63	.....

The capitalization of these 20 companies is $102,233,700; the excess of value over and above their capitalization at the date of this inventory was $19,397,612.63.

THIS INVENTORY WAS BASED UPON THEIR OWN TESTIMONY.

Q. Will you make it clear what you have based this inventory upon and who took the inventory? A. It was taken by the representatives of the trust certificate holders, I think.

Q. (By Mr. North.) On what basis was that appraisal made; do you know that? A. I asked Mr. Rockefeller the following questions: "Give the surplus money in the hands of each and every constituent company, corporation, and limited partnership as represented by trust certificates of the Standard Oil Trust on or about January 1, 1892, and how much after the payment of their last dividends, stating when such dividends were declared and paid and the total amount of each, and whether said dividends were turned over in each and every case to an official representing the Standard Oil Trust." And this was the answer he gave:

"I have not in my possession or power data showing the surplus money in the hands of each and every constituent company, corporation, and limited partnership, as represented by trust certificates of the Standard Oil Trust on or about January 1, 1892, nor the amount of such surplus money in their hands after the payment of their last dividends. During the year 1892 a careful inventory and appraisement was made of all the assets of said companies, and the result was found to be as follows:" (The above figures are taken from this complete answer.)

Q. That was their own appraisal? A. That was their own appraisal. We were obliged to take that, as they refused to produce their books. There is a matter now pending before the courts of Ohio whether or not it invades constitutional privileges if they are required to disclose their books for such purposes. We have asked for the books, or original testimony, so far as it bears upon our litigation.

DIVIDENDS AND THE VALUE OF THE TRUST CERTIFICATES.

I then asked for the last dividends of said companies, prior to November, 1897. The copy of the record of the Ohio supreme court proceedings, that I leave with you, will give you the list of the companies and the amount of dividends paid by each. Some of the companies pay quarterly dividends, some annual, and others, apparently, have declared no dividends for the last year.

LIST OF DIVIDENDS.

The last dividends of said companies prior to November 9, 1897, were as follows:

Anglo-American Oil Co., Limited, June 15, 1897.	$ 506,480 00
Atlantic Refining Co., Mar. 15, 1897.....	1,999,600 00
Buckeye Pipe Line Co., Sept. 15, 1897.....	3,999,780 00
Eureka Pipe Line Co., Sept. 15, 1897.....	599,868 00
Forest Oil Co., Oct. 30, 1891.....	287,100 00
Indiana Pipe Line Co., March 15, 1897.....	999,450 00
National Transit Co., June 15, 1897.....	2,545,475 00
New York Transit Co., Mar. 15, 1897.....	1,999,600 00
Northern Pipe Line Co., Sept. 15, 1897.....	232,244 25
N. W. Ohio Natural Gas Co., Sept. 15, 1897....	29,497 50
Ohio Oil Co., June 15, 1897.....	999,887 50
Solar Refining Co., June 15, 1897.....	147,234 50
Southern Pipe Line Co., Sept. 14, 1892.....	300,000 00
South Penn Oil Co., June 15, 1897.....	2,498,900 00
Standard Oil Co. (Indiana), Mar. 15, 1897.....	699,300 00
Standard Oil Co. (Kentucky), Mar. 15, 1897...	1,998,000 00
Standard Oil Co. (New Jersey), Sept. 15, 1896..	2,499,775 00
Standard Oil Co. of New York, June 15, 1897...	1,749,725 00
Union Tank Line Co.—No dividends declared.	

No dividend, the company claims, has been paid by the defendant company since the distribution of surplus made March 17, 1892. Prior to August 5, 1891, the defendant company was the owner of a large number of tank cars, most of which had accumulated under the management of the trustees, which were rented to other companies. Its stockholders and directors determined that it should discontinue the transportation business, and on August 5, 1891, the defendant company sold its tank cars to the Union Tank Line Company, and received in payment therefor the sum of $3,500,000. Of this sum, on March 17, 1892, it handed over to the trustees $3,219,540 for distribution by them among the holders of trust certificates, this being the distribution referred to in the answer filed by this company, and, the company claims, the only distribution or payment made by the defendant company to the trustees since the former decree of this court. This sum, or the balance remaining thereof after settlements of contracts, agreements, and accounts by said trustees, as shown in their resolution of May 16, 1892, was distributed to the holders of the trust certificates. The surplus since accumulated in the hands of the defendant company amounts to $700,000, which is invested in Government bonds.

The answers to the preceding interrogatories are all we have to show to whom, in every case, dividends were paid. They were paid in each case by the company declaring the same to its stockholders of record, the liquidating trustees receiving dividends from companies other than this defendant upon that portion of the capital stock of the said several companies which is held by them, awaiting reissue to the dividend owners thereof on surrender of trust certificates.

Q. (By Mr. Jenks.) They are not all quarterly? A. No.

Q. Can you give the distinction? A. I can not give you the distinction. I will furnish you with a list of the entire dividends, at the last payment, including the quarterly, which amounts to something over 24,000,000. According to that, the value of trust certificates is to be estimated at about 480 or 500 per cent, and since they have it in their power to control the retail price of oil, they can, by raising or lowering it, make a dividend at about what they please. They have raised the retail price of gasoline and oils at noncompetitive points since this suit was instituted, and it has had the effect of increasing the value of their trust certificates. I can give you the dividends that have been declared since 1892.

Q. Could you furnish us the prices at competitive and noncompetitive points, A. Yes; I will do that later. Just prior to the date of General Watson's decree they organized a Union Tank Line Company, and they took out of the business of the Standard Oil Company of Ohio the assets formerly used in the transportation of the refined products, amounting to $3,500,000, so that these constituent companies now have their respective departments. As I narrated in the opening of my testimony, although substantially the same men are in control, the companies have different functions. On March 17, 1892, they turned over to the trustees of the trust for ditribution, after the decree of the court against the trust (which is one of the things we claim to be a violation of the order of the court) the $3,500,000 assets so acquired; and that was distributed among the holders of the trust certificates after the courts ordered them to withdraw from the trust. They were interrogated further as to what they have since done with the accumulations of the Standard Oil Company. They have attempted to account for their accumulations by charging off in profit and loss accounts by way of depreciation in the plant. These figures I can furnish you. Mr. Squires claimed (he refused to produce the books) and gave as his conclusion February 7, 1895, that $230,019.96 was charged off for depreciation of plant December 31, 1894, and on or about May 31, 1896, they charged off $1,200,000 more for depreciation of plant. They hold $700,000 in Government bonds.

Q. Is that amount charged off for depreciation supposed to include the dismantling of any plant they had purchased and put out of operation? A. No. The Standard Oil Company, as a "going" concern, had accumulated assets all these years, according to our theory. They only redeemed 51 and a fraction per cent of trust certificates, or enough to have the control, and they continue as they always have. These Standard Oil trust certificates are still on the market, and are nourished in some way, or they would not be paying these trust-certificate dividends. The other 19 companies must at least be nourishing them. The Standard Oil Company of Ohio had to account for the distribution of its income. It had this theory, viz, that it has earned nothing since the decree, but will not produce the commercial books to corroborate it.

BOOKS BURNED BY THE TRUST.

Q. How about the charge of burning their books? A. We adjourned on the night of February 15, on

Thursday, and they were required to appear before the court on the following Tuesday to show reason why they should not abide by the order of the master and the decree of the court and produce their commercial books. We received an anonymous communication that they had burned their books. We subpoenaed certain parties and had them testify as to the fact. The information to the State, after following up the matter, was that they had burned 16 boxes of books. I give you Mr. McNirney's testimony touching upon the subject.

Attorney-General Monnett then read extracts from the testimony of Mr. John McNirney as to the burning of the books. The direct examination of Mr. McNirney in full is as follows:

John McNirney, of lawful age, being by me first duly sworn, as hereinafter certified, deposes and says as follows:

Q. (By Mr. Monnett.) State your name and residence to the notary. A. John McNirney, 85 Oregon Cleveland, Ohio.

Q. What is your business, Mr. McNirney? What company are you working for? A. The Standard Oil Company.

Q. How long have you been working for them, and what time? A. Three years next September, as car builder and repairer.

Q. On what street is their car-building works? A. On Broadway, I believe.

Q. Where are the general offices of the Standard Oil? A. As I understand, on Euclid avenue, what they call the Standard block; and they have got another general office for the shop on Broadway.

Q. Then part of the works is on Independence street, is it not? A. I believe it is. Now, I don't know anything about that. I know that the works where I work is on Broadway.

Q In the car shops? A. In the car shops; the hill shop.

Q. You may state whether or not you were called, on or about Saturday the 19th of November, to the general offices to do any work in the way of removing boxes or books, or anything. A. Yes; I was.

Q. You may state just what the work was, and commence with the first. What time of day did you get there? A. We got there about 11 o'clock in the forenoon.

Q. What was the first thing you did? What did you help do? A. The first thing we did was to lower a lot of books from the fifth story to the ground floor.

Q. Lower them? A. I didn't say books; I say boxes. I don't know what was in the boxes. To lower a lot of freight boxes—supply boxes. We call them supply boxes.

Q. Did you help pack the boxes or anything? A. No, sir.

Q. Whom did you lower them to? What teamsters, if you know any of them? A. There was a teamster there, but we was going to take the books —I say boxes—out in front; but, as I understood, the janitor objected and said we must take them out in front; we must take them out in the rear of the building.

Q. You lowered these boxes with a tackle from the rear window? A. No; on the passenger elevator.

Q. You lowered them with that? A. With that; yes, sir.

Q. What was done with them after that? What teamster? A. We took them up again. When they objected, we took them upstairs again.

Q. Then what was done with them? A. Then we lowered them from the back window in the yard in the rear.

Q. What kind of a device did you use to lower them with? A. A tackle.

Q. What teamsters, if any, got them? A. I could not tell you. I could not swear to the name of the teamster. I know him, but in our capacity we don't come in contact with teamsters very much.

Q. Was Edward O'Hearn one of them? A. I could not swear that was his name. I would not swear that was his name. I know him personally, but I don't know his name. I meet him every day, but I don't know what his name is.

Q. You would know him if you saw him? A. Yes.

Q. A black-mustached man, about your age? A. An Irishman.

Q. A little heavier set? A. Yes, sir. I would know him if I saw him again. I see him every day. I don't know his name.

Q Was there any other man assisting? A. Yes, sir.

Q. Who assisted you? A. Moran.

Q. Moran; what is his business? A. He is a car builder and laborer.

Q. Do you know a man by the name of Gabeline? A. Yes; I know him.

Q. Did he assist you? A. I believe he was at——

Q. Where was he; at the offices or at the car works? A. At the general offices.

Q. Do you know a man by the name of Shafer? A. Yes.

Q. Was he assisting in any way? A. I believe he was there, too.

Q. At the general offices? A. At the general offices.

Q. What did they do? A. They assisted to lower the boxes.

Q. After they were removed and taken down the tackle, then where were they taken to? A. I believe they went to the warehouse.

Q. Did you ever afterwards see them; and if so, what did you do with them? Did you after that see the same boxes? A. I saw the books; I don't swear they are books, because I don't know what was in the boxes.

Q. Where were they when you saw them the next time—the same boxes? A. In the warehouse.

Q. You may state, then, if you had anything to do with the opening or burning any books about that time? A. Yes, sir; we did burn some of those books next Monday. No; we didn't burn them all; I don't think we burned all we took out. I did not keep no track, and wasn't interested, and don't know how many books we burned.

Q. Did you have more than one burning; were you at it more than once? A. Yes, sir; twice. The first lot we burned in the car shop furnace.

Q. What sized books were those? A. Large and small.

Q. Give the size of the biggest ones, the thickness. A. That high [indicating].

Q. That would be 2½ feet high? A. Well, I don't know. I say about 20 inches.

Q. The books were about 20 inches? A. The chest about 20 inches, and they come up to the top.

Q. About how thick were they? A. All sizes; I didn't pay no special attention. We burned some big boxes and some small ones. I wouldn't swear how big they were.

Q. You held this way: about 8 inches high and 6 inches wide. A. We didn't pay much attention, because we had to get them in there quick. I know they were large, heavy books, almost as much as a man could lift, some of them; what I call ledgers—large books.

Q. Did you burn up loose papers? Yes, sir; we burned papers and letters in a sack.

Q. How many were left to burn the next night or on Monday night, you say? A. I think we burned 9 chests and 6 sacks. Those sacks were all letters; copying books, I should think, or something like that. Loose papers, waste paper, I say.

Q. Letter-press books and letters and waste paper? A. I should say waste paper.

Q. How many chests were there originally, about; do you remember how many made a load? Sixteen, I believe, made a load; 16 chests.

Q. At the furnace, who helped you throw them in? A. Moran.

Q. What is his position? A. Car builder and repairer.

Q. What is his first name, do you know? A. I couldn't tell that; you know, although I know him 2 or 3 years, yet I don't know his name. We work with them every day and don't know their first names.

Q. Is he your boss? A. He is a young fellow; he used to cut bolts; he was a kid, about 20 years; he used to cut bolts.

Q. Were there any of the books that were not burned that were concealed down there in that package or hid away?

(Objected to.)

A. What I know—I don't think we burned all the books, because we took more than we burned, as far as I know. I don't know anything about that.

Q. Who else about the offices up there—at the general offices—assisted in this in any way besides Moran; do you know? A. In the burning of the books?

Q. Either at the offices or in the burning of the books; what other parties? A. I don't know their names.

Q. What part did Gabeline—did he help take them out of the boxes? A. No; he didn't help to take anything out of the boxes. He did not know what was in the boxes.

Q. He just helped move the boxes up at the offices? A. Yes, sir; we were short-handed, and they sent a party from the car shop to assist us load the boxes at night.

Q. Were the boxes themselves loaded at night, after they were taken down by the tackle? A. The boxes were locked, securely locked; I don't know whether they were securely locked; some of them had no locks on.

Q. You described, if I understood you, as having taken them down, or a part of them down in the elevator first, and then the elevator man—— A. The janitor objected, and we had to take them up, if I understood that.

Q. The reason you had to take them back again and he would not let you come down the front way, you had to take them out of the back window? A. Yes, sir; that is the reason we had to lift them to the third story and lower them out of the back. We could have done very quickly if we could have taken the boxes in the front.

Q. What street, then, was the wagon backed up on? A. There is no street there; it is a yard.

Q. How many different teamsters do you think had a hand in handling the stuff? A. Now, I think there was about three; I don't know the names of the teamsters; the first load I don't know anything about. They took the first out on Friday—took that up to the offices, and we destroyed that load in the morning. I don't know who brought that load up.

Q. Was it Saturday morning that you destroyed them? A. Yes; Saturday morning, and O'Hearn, I guess, was the man's name that took the two loads on Saturday night.

Q. Were they the same boxes each time, and return the empty boxes? A. No; I would not say the same boxes; they have lots of boxes—any amount of them, hundreds of boxes.

Q. What kind of sacks were those? A. Gunny sacks; common ones.

Q. About how high would they be when they were full? A. About that high [showing].

Q. About two feet high? A. Potato sacks; what commissioners use for potatoes.

Q. Gunny sacks, such as commissioners use for putting potatoes in? A. Yes, sir.

Q. The first time you burned them, about what hour did you commence burning them down there in the car shops? A. I don't know about the hour; probably 8 o'clock.

Q. Saturday morning? A. Half past 7 or 8.

Q. On Saturday morning was the first? A. Yes, sir.

Q. Then when did you commence on the second time? A. We commenced then about—Monday we commenced about 10; maybe half past 10.

Q. The same parties present each time? A. Yes, sir. Now, not all parties, because only two of us fired the pump-house boilers.

Q. Why did you change from the car -shop furnaces to the pump-house boiler? A. As I understood it, because they put the steam down—the books would not burn.

Q. How do you mean—putting the steam down? A. In the car shops they fire with shavings from the cooper shop and car shop; there is nothing but bones and shaving and small stuff goes in there.

Q. It don't keep a steady fire? A. Yes; the shavings keep a steady fire; but when books went in they didn't burn rapid enough to keep steam up, so the steam went down.

Q. And then you had to go over to the other shops. What kind of furnaces have you at the second shop? A. Just a common—I guess Sterling boiler; I don't know the name of the boiler. I know we fired the boiler from about 10 o'clock, I guess, till half past one—we put these books in.

Q. Large, solid books burn fast or slow? A. I judge they burn kind of slow. Paper burned all right and kept up good steam.

Q. But the heavy books in the first furnace practically put the fire down so low that you could not run? A. I don't know, but that is what I understood.

Q. How far is the sceond furnace from the first one—the same building? A. No; there is the pump house on the river, and the car shop is on the hill.

Q. The last books were burned by the river in the pump house? A. Down by the river.

Q. Who all did you see up there at the general offices besides the two you have given? Moran is one you have given and Gabeline is another. A. He don't know anything about the burning of those books.

Q. Moran helped you at the general offices; Moran helped you at each place at the general offices? A. Through the whole transaction.

Q. Through the whole transaction? A. Yes.

Q. From whom did you get your orders to go up to the general offices and do the burning? A. The car shop foreman.

Q. That is Mr. Moran? A. No.

Q. Who is the car shop foreman? A. His name is George Fields; he is the car shop foreman, or was at that time, because the master car builder was away at that time, and he was acting as master car builder.

Q. When did he give you these orders, with reference to the first that you started out; on the same day; on Friday? A. What orders?

Q. To go after these books, or to go up to the general offices? A. Yes, he gave me orders to go up to the general offices and get these books.

Q. About what time of day was that on Friday? A. On Friday, I should judge, about half past 9 or 10 o'clock in the morning. We got up there about 11. I should say, as near as—I would not swear to the exact time, because I don't know, though it was before dinner time when we got up there; the clerks were all there yet.

Q. The clerks were all in the office yet? A. When we got up there.

Q. Was anybody in the office when you were moving these boxes out? A. They were all in there—all the clerks.

Q. Did anybody up there give you directions about getting them out other than Moran? Who gave you directions about where to get the boxes up at the offices? A. They had the boxes tagged for distribution.

Q. What places were they tagged to—to what places were you to take them? A. Well, now, I couldn't tell that; I don't know whether they were tagged for the car shop or just Charles Hogan, for distribution.

Q. Who is Charles Hogan? A. He is general superintendent, as I understand.

Q. Tagged to him. Where does Charles Hogan hold forth? A. What is that?

Q. Where does Charles Hogan have his headquarters, at the Broadway or Independence street shop? A. I believe his headquarters is at Broadway.

Q. What kind of a looking man is he? A. A fine looking man.

Q. Black-mustached man? A. No. He is a young man; he has got no mustache at all; smooth-shaven, clean-faced; not a very oldish man. He is superintendent. He can tell you more about those books than I can.

Q. That is Charles Hogan? A. Charles Hogan.

Q. I was informed he could, but we were not able to subpoena him yet.

Q. (By Mr. Jenks.) You believe these books that were burned were the ones you required Mr. Squires to produce? A. That is the fair legal presumption from the testimony, considering the size of the books the size of the boxes, the number, the circumstances, and the refusal to produce them afterwards, although Mr. Kline in open court stated that they had not destroyed them, that they had them yet, and that they would not produce them on request of the chief justice of the court. They absolutely refused to produce them, and relied upon their constitutional privilege to refuse to answer. The exact testimony as to the burning of the books I will furnish you for your own conclusions. The only purpose in bringing it in here is to show you we are adopting their explanation as to profits, the way they distribute them, etc. the reason being that we do not have the substantive evidence which they keep from the public.

Q. You have spoken of the trust certificates—perhaps you can furnish us a copy of those. A. Yes; I also hand you this list of dividends declared by the Standard Oil Trust and the amounts. It is part of Mr. Rockefeller's testimony.

DISTRIBUTION OF TRUST CERTIFICATES—SALARIES.

Q. (By Mr. Phillips.) For what period? A. Covering from 1892 to date, if you wish them. If you care to have it, I will furnish you a copy of a share of trust certificates that were issued to the original stockholders, Mr. Rockefeller receiving more than any other man. He received, January 1, 1882, for his stock in the Standard Oil Company of Ohio alone 191,700 trust certificates. His interests in theStandard Oil Company of Ohio netted him in trust certificates alone, at that time, a par value of $19,170,000 Mr. Rockefeller receives $30,000 a year salary, as

I understand it, from the Standard Oil Company of Ohio, which was the amount he received originally as chairman of the trustees of the Standard Oil Trust. The trustees of the trust held 466,280 shares They also hold more than half of 35,000, about 23,-314. Mr. Rockefeller seems to have held the majority of these, or the balance of power—that is, of the 17,000 shares he holds 9,585 shares.

MR. ROCKEFELLER HAS ABSOLUTE CONTROL.

Q. That gives him, individually, absolute control? A. Yes; it is a scheme whereby, when these 20 companies were once in the trust under the control of the 9 trustees, Mr. Rockefeller could control the trustees. It is practically a one-man power for the whole organization, and when you look at it, he, as an individual stockholder, assigned to himself as a trustee, and then as a trustee assigned to himself as liquidating trustee, which he is still. He has, with his henchmen, the power to fix his own salary and those of the trustees, and when sifted to the bottom I think it is a fair deduction to say that he has control.

Q. (By Mr. Jenks.) If I understand you, he does not need the aid of his "henchmen?" A. Not for part of these companies. Before a man could have his trust certificates reconverted into constituent stock and get out of the trust he would have to hold $66,000 worth. In other words, the men who hold the larger amounts and who are the trustees, are able to convert their certificates and still hold the balance of power in the 20 constituent companies, having the voting power now as they had before. They have, to all intents and purposes, the opportunity, at least, to absolutely control the 20 companies as much as they had before the decree; the decree has not bothered them except in bookkeeping.

Q. Will you make it a little clearer how the organization of this company brings that about? A. I understand that the owners of the original constituent stock, in turning it all over to the 9 trustees, got in return a fractional part of the stock of every one of the other companies. When they came to convert their trust certificates back into constituent stock they did not own a distinct portion in any one company, but a portion in all the 20. They might have enough trust certificates to secure, we will say, two shares in a large company and but three or four in any others, but not enough to secure more than fractional shares in the small companies, from which they could receive no dividends, fractional shares not paying dividends. Therefore, there is no inducement to persons holding trust certificates to turn an investment paying 35 per cent on their original purchase into something for which they can get nothing, viz, scrip or fractional shares. Such persons are forced to stay in the trust, or hold trust certificates; but the larger owners can get theirs reconverted, and they, being so few in number, and being trustees, are still in command.

AMOUNT OF DIVIDENDS PAID BY THE TRUST.

Q. You stated that the holders of the trust certificates were receiving 35 per cent on these certificates. A. I will give you the exact figures. I should say that the 972,500 original trust certificates only represents a part of them, for they had it in their power under this contract to issue practically what they pleased. December 15, 1898, the liquidating trustees, that is, Mr. Rockefeller, representing the Standard Oil Trust certificates, held their meeting November 3, 1898, at 26 Broadway, and December 15, 1898, adopted the following resolution:

New York, December 15, 1898.

At a meeting of the liquidating trustees of the Standard Oil Trust, held November 3, 1898, the following resolution was adopted:

Resolved, That there be divided, from the income of the stocks still remaining in the hands of the liquidating trustees, a sum equal to three dollars ($3) upon each share of said trust; also a further special sum equal to four dollars ($4) upon each share of said trust, payable on and after December 15, and that the transfer book be closed from 3 p. m., November 16, to 10 a. m., December 16, 1898.

Enclosed please find check on National City Bank of New York for your proportion of the distribution, in accordance with the above resolution.

No acknowledgment.

(Signed) WM. T. WARDWELL,
Assistant Treasurer.

The following is the form of the check:

No. A B 2523. New York, December 15, 1898.

National City Bank.

Pay to the order of Geo. Rice forty-two dollars.

Trustees to liquidate Standard Oil Trust.
By H. M. Flagler,
Treasurer.

$42.00

Being quarterly payments, these dividends would be at the rates of 12 and 16 per cent per annum, which would be nearly 30 per cent for that year on the original basis of value. According to this, 35 per cent would seem to be a fair deduction. In 1892, after distributing $3,121,725 surplus, which they had on hand, among the holders of 972,500 shares, they distributed $3.21 on each $100 of surplus. On March 15, June 13, and September 15, they paid $3 a share upon the trust certificates. On May 20, September 15, and December 15, 1893, they paid $3 a share, and on March 15, September 15, and December 15, 1894, $3 a share.

Q. (By Mr. Phillips.) Is $3 a share generally a quarterly payment on $100? That amounts to $3,-000,000 per quarter, $12,000,000 per annum. A. Their dividends at one place were given at $24,000,-000. That included the dividend on stock, 51 per

cent of the trust certificates having been turned back into stock, while 49 per cent are still held as trust certificates. That is the dividend annually on the trust certificates.

Q. Three dollars per share each quarter? A. Yes. On March 15, 1895, they paid $3 a share, less the income tax, which, I suppose, was returned to them; on June 15, 1895, they paid $3 a share, less 6 cents per share, in anticipation of the income tax, the income tax case then being in the hands of the court; on August 21, 1895, they paid $3 a share, and on November 20, 1895, they paid $3 a share and $5 extra. The next quarter, March 17, 1896, they paid $3 a share and $5 extra.

Q. That would be $13,000,000 in that quarter? A. Yes; that quarter. On August 4, 1896, they paid $3 regular and $7 extra; on November 5, 1896, $3 regular; on November 18, 1896, $3 regular and $2 extra; on May 19, 1897, $3 regular and $7 extra; on November 17, 1897, $3 regular and $5 extra. That takes it up to time for which I asked data. I have summarized here somewhere the total dividends paid up to that date. I think I can get that for you. I have summarized it in a statement to the court.

SALARIES, ETC.

What the 20 constituent companies paid out to directors and their respective officers we have no means of ascertaining, except for the one Ohio company. It is probable their salaries run from $40,000 to $50,000 for the president of the larger companies. Of course, under the decree of the court, they have to pay these salaries through some other device than the trustees. They must now pay them through the constituent stock companies. Mr. Rockefeller, on cross-examination, said he receives his income or dividends from his holdings, just the same now as he did when they were in the trust, but in a different form. He receives them as holder of a certain number of shares in the 20 companies, which he says are now resolved into constituent stock, while before that he received it in dividends on trust certificates. Mr. Corrigan's testimony and the pleadings set forth that Mr. Rockefeller held, since 1892, a large block of these trust certificates as collateral security and was the beneficiary of the income for his protection. As I said, that was in a separate suit, and will be found in the testimony of Mr. Corrigan.

VALUE OF TRUST CERTIFICATES BASED UPON INCOME.

The present value of the certificates based upon income is 500 times 972,500. As a prominent judge puts it: "There is no expert who is better qualified to testify as to the value of a plant than the shrewd manipulator and buyer in the open market. Considering the fact that three-sevenths of the trust certificates have not been reconverted, in connection with Mr. Rockefeller's testimony that he gets his interest just the same now as he did before, the present value of the aggregate stock of the companies and the trust certificates may be fairly estimated at $486,250,000, provided they have not issued, as they could under the trust agreement, more than the original amount of trust certificates. If that is all of the trust certificates that are out; they would now be worth, instead of $97,250,000, their original estimated value, at least five times that amount; and if the constituent stock is worth, in the hands of the trustees or the holders, the same, being in a different form only, that would be the stock value.

Q. (By Mr. Jenks.) Have you anything further in regard to evasions or profits that you can furnish? A. No; you can make your deductions from these figures, I guess.

THE PURCHASING AND DISMANTLING OF COMPETING PLANTS.

Can you give us any information on the question of the purchase by the Standard Oil Company of competing companies and the dismantling of their plants? A. The refining plant at Whiting, Ind., has absorbed the business of the plant at Cleveland since 1892, making a fair deduction from Mr. Squires's testimony that they charged off the two items I have heretofore given you. They have reduced their men more than two-thirds in Cleveland and transferred them to other fields. If you will call Mr. D. W. Brown, of Cleveland, and Scofield, Shurmer & Teagle, you will get the data on this subject. I am only giving the conclusions. After establishing the new plant at Whiting, they got a freight rate to southern fields, e. g., New Orleans, of 23 cents a barrel, as against one of about 33 cents and a fraction from Cleveland; in other words, Scofield, Shurmer & Teagle, competing from Cleveland, were handicapped by the difference between 33 cents and 23 cents in freight rates, almost 50 per cent more freight in sending to a distributing point in the south. The commercial wisdom of their establishing a plant at Whiting and shipping at a lower rate over the Illinois Central is very apparent, for no other competitor could start from Whiting or ship from there. While they would not dare, under the inter-state commerce law, have a different rate for different people from Cleveland or from distributing points, they managed to get different rates by changing their refineries to noncompeting points.

As to the dismantling of the plants at Marietta, I think I can give you the data from Senator Davis's testimony. They practically dismantled all the competing concerns there and at Parkersburg, and left nothing but a burnt-out crater. The last one to go was the Argan Refining Company, which they could not dislodge because its owners, Mr. Rawn and Mr. Peabody, were the directors of the Baltimore and Ohio Southwestern Railway, and the oil trade was a source of large profit. One of the opportunities for discrimination in freight rates consists in the bookkeeping arrangements between the Standard Oil Company and the railroads concerning the price to be charged up against the roads for lubricating

oil furnished by the Standard. As they did not furnish the lubricating oil to the Baltimore and Ohio Southwestern under Mr. Rawn, they could not freeze out or exterminate the Argan Company; hence they bought the plant, paying $12,000 a year to remain idle, and are now dismantling it. They have taken up the pipe line leading to the plant. Although the Argan continued selling oil, apparently in competition with the Standard Oil Company, it was in fact the Stnadard Oil Company's own plant. The Argan people get $12,000 annually, besides a bonus that was paid down. I think the plant is to remain idle for 10 years, but at the end of 10 years, at the rate of the present disintegration, it will continue to remain idle. I advise you, if you will allow the suggestion, to get ex-Senator Davis, of Marietta; he is a very intelligent gentleman and can give you the data with reference to the destruction of competing plant at that point. Mr. Peabody was the other man who had an interest in the Argan. They furnished the lubricating oil to the Baltimore and Ohio Southwestern from the Argan. The Argan was able, with that advantage, to compete with the Standard, which could not destroy them.

Q. Have you any information in reference to the prices paid by the railroads to the Standard for lubricating oil? A. No; I can not give you correct data; you can get railroad men on that point; if you call Ira Rawn, of Cincinnati, you can get the information; Mr. Peabody died about six weeks ago. After the Corning field was opened up, above the Macksburg field, they raised the transporting price of the pipe line to 17 cents. At 17 cents it was unprofitable for the owners of those fields to ship to Parkersburg or Marietta. In gaining control of the transportation department, you will find, gentlemen, lies the secret of the maintainance of discrimination in favor of commercial trusts.

TRANSPORTATION COMPANIES EXERCISE PUBLIC FUNCTIONS, AND COULD BE CONTROLLED.

If Congress would enact laws, or if the executive officers would bring these companies before courts, they could be punished, for it is to be remembered that the right of eminent domain can not be exercised by corporations except as granted to them. The right of eminent domain is authority for a corporation to take private property for public purposes. If, after it is once so taken, the corporation having that governmental function vested in it were held down to the same strictness in its exercise that the Government holds all other officers exercising similar functions, there would be very few of these industrial combinations. It is a plain proposition that these trusts must necessarily link themselves with sovereignty, and it is entirely inconsistent with the fundamental principals of the Government that corporations so obtaining private property should use such property in any other manner than for the public good. If an assayer, or a man commissioned to coin money, who is only exercising a governmental function, should clip the coin and make it light weight, and profit by the difference, he would no more be violating the principals of the franchise he is exercising, in a moral or commercial sense, than these men who take public property, as a pipe line company or a railroad company, for the purpose of a common carrier, which they can get only through power from the State, and afterwards use it for private ends. The remedy is simple; it is one in which the courts have never once faltered when it is presented to them. When a corporation exercising governmental functions, such as the right of eminent domain, does not return the contractual relation to sovereignty required of it, viz, that of a common carrier, its charter should be taken from it, or, if that be too drastic, the franchises it is now exercising should be taken away. Whenever a common carrier or railroad company undertakes to water its stock or to discriminate between one town and another, or whenever it undertakes to get advantage through a tank line freight rate as compared with a barrel rate or other means of shipping, it could be easily made a ground for forfeiture; it is all under legislative control. It is a violation of the fundamental contract they made when they accepted the charter. It is not true that it is due to a difference in talent and ability that such men as the trustees of the Standard Oil Trust have been able to defeat their competitors; it is a matter of a criminal abuse of the commercial privileges they have received. The railroad company or the pipe line company has no more right to abuse the power granted it by the State in its charter than the man who is coining money on contract for the Government has to coin 50 cents of metal into a dollar; it is just as much a crime as the violation of any other governmental function exercised by an executive officer.

GOVERNMENT SHOULD MAINTAIN COMPETITION.

Q. Would you favor the regulation of rates by the Government itself? A. I have answered that. While I am not a believer in Government ownership, with the present limited civil service, I do say that the remedy is for the Government to maintain competition. The competition of giants with one another will regulate their conduct, but a pigmy can not compete with a giant. There is no one man so strong that, if the Government does not assist him, he will not find a competitor.

Q. Is it your idea that the pipe line companies should be forbidden to discriminate, or that the Government should hold the rates down to what is reasonable? A. If a pipe line company charges 20 cents, when it costs less than one-tenth of a cent a barrel per mile for shipping, it is an abuse of a governmental function, and the company ought to have its charter taken away for excessive charges. Persons obliged to compete under the circumstances are like farmers who should have to pay $3 to $5 a load for hauling their wheat, while some one else has the public right of hauling his for a dollar.

Q. Have you any specific suggestion as to how that rate could be held down? A. The Cudahys, at

Chicago, would run a pipe line; they have been for years trying to get a pipe line privilege in Indiana and Ohio. One of the independent men, of New York, said he would give $24,000 for three miles of line to connect up his lines with the seaboard. Wherever a common carrier is undertaking to thwart a competitor the Government should interfere. If the owner of a public utility is obliged to submit his rates to open competition there will be no more oppression in that department than in any other.

GROSS RECEIPTS AND PROFITS FROM THE BUSINESS IN OHIO.

To illustrate, the Buckeye Pipe Line had a gross income in 1898, ending May 1, from the Ohio fields, as I understand it—and this is the sworn report of Mr. Theodore M. Tole—of about $6,763,094.64.

Q. What is Mr. Tole's official position in connection with the organization? A. He is called the tax agent of the Buckeye Pipe Line Company. He is of New York. You will find him also making reports for the Standard companies, although these companies claim they are not a trust and have no connection with the trust. They have a faculty of having the same tax agent and the same attorneys and the same telegraph companies and other common agents, that give it a colorable union, to say the least. The gross receipts were $6,763,094.64. The universal rate everywhere, except on oil right from the field at Corning, has been 20 cents a barrel. In 1897 their gross receipts, at 20 cents a barrel, were $6,800,833.19. Their gross receipts for 1896 were $5,941,567.85. The total gross receipts for these three years are $19,495,495.68 for the Ohio business. Counting the shipping price at 20 cents a barrel, the total amount received from the Ohio fields for three years would be 97,472,475 barrels, or over 30,000,000 returned for taxation, is the amount shipped through the Buckeye Pipe Line. The leasor gets 60 cents a barrel for one-sixth of the oil, and at that rate the landowners received out of their Klondike of wealth, for the three years, $9,747,000. We have no means of knowing what additional royalties or sub-contracts they make. At the rate of $4 a barrel, the noncompetitive price of oil, the gross receipts for Ohio would be about $120,000,000 a year.

Q. This is refined oil you are speaking of? A. This is the refined oil at their noncompetitive price of selling. They get 8 to 11 cents. I will assume in this that when the Buckeye Pipe Line Company give us the gross receipts for Ohio business their oath is correct, and that they get 20 cents a barrel for all the Ohio oil shipped. The Ohio landowners, for the three years, receive a little over $3,000,000 annually. It takes about four barrels of crude oil to make three of refined, and the shrinkage of one barrel, or one-fourth, is made into by-products, such as paraffin, axle grease, etc., for which they get as much as the refined oil, so that they practically average, as experts tell me, $4 a barrel, making, at this time, about $120,000,000 gross from the Ohio product. Figuring it in round numbers, all over 3½ to 4 cents per gallon is net profit; it can be delivered at that price in Ohio. In fact, they cut it down to 4 cents a gallon whenever they have competition. They get 8 to 11 cents when there is no competition. The value of all the farm products of Ohio (I mean by farm products wheat, wool, oats, barley, live stock, etc.- taken from the tax return valuations is between $52,000,000 and $53,000,000. The oil combination's profits, if our deduction is correct, are about equal to the combined incomes of the farms in the State. In other words, by their system of noncompetition, consumers, on the one hand, pay much more, and the producers, on the other, receive that much less than they should. They drive the producer and consumer that far apart. There is no secret in the refining of oil; there is no patent on shipping; it is simply in stealing the powers of the Government, thereby controlling transportation. The State is now seeking to take away the charters of such companies as abuse their powers and franchises in this way.

BASIS OF THE LEGAL PROCEEDINGS IN OHIO.

Our acion is based upon the statutes of Ohio and upon the cases of Darcy vs. Allein (Coke's Reports), and Richardson vs. Buhl et al. (77th Michigan, 632; the Salt Company against Guthrie (35th O. S., 666); and Emery vs. Ohio Candle Company (47th O. S.). It is no new principle. That will be the remedy. Under our Ohio law, when a corporation violates its charter by ultra vires acts, or is exercising a franchise contrary to the statutes, the State revokes the charter, the courts appoint two trustees, who have the functions and powers of a receiver, who take charge of the business and wind it up and sell it to law-abiding investors. The iniquity of the Oil Trust in Ohio is for the owner or the one producing the oil and getting barely the lowest competitive price for it to be paying at the same time a trust price for the refined product; and it is no answer to say that a small number of people get the best wages because they are hired by the trust, when the great body of the people are contributing in receiving a mere pittance for crude oil.

EFFECT OF THE STANDARD OIL COMPANY ON WAGES.

Q. Can you give us any data regarding the effect of the Standard Oil Company on wages? You called attention to the fact some time earlier that it threw a great many people out of employment through the destruction of competing plants. A. That you will get from men who have the actual data. It necessarily throws all the men out of employment when they dismantle a plant.

Q. The specific data on this point you have not yourself? A. I can give you the original testimony later, when it is printed; but if you will get Mr. Davis and Mr. Butts, of Marietta, and Mr. Rice, formerly of Marietta, they can give you the exact data and the losses. I have given you the facts

concerning the Argan Company. The trust shuts out all competition in the payment of wages, because while men may go into the oil field and buy oil they can only ship it through the trust's transportation department. There is no competition in selling, for there can be no competition where the Standard is the sole buyer. If you select an oil field anywhere in Ohio, you can not get to a refinery except through their pipe lines. It is true they furnish you a market but if you do not take their price you can not start up; you can not refine; the moment you refine and go to ship you find yourself blocked; they will destroy your plant by reducing the value at a given point and raising it at noncompetitive points, so that they will be no losers themselves. I have a few statistics on the prices of oil at competing points and noncompeting points which I will leave with the commission if they care to have it.

RELATIONS OF THE STANDARD OIL COMPANY AND THE PRESS.

Q. Can you give us any information with reference to the influence of this company on public sentiment? It is asserted, is it not, that they control the press more or less completely? A. Well, in view of the fact that some newspaper reporters are here, I presume it would not be a very wise thing to discuss that. The Standard Oil Company of Ohio, after this suit was begun, through Henry M. Apthorpe, of Cleveland, and Mr. Jennings, of Columbus, organized what is known as the Jennings Publishing Advertising Agency. At the time we took our testimony at Marietta we found several men who had received marked copies of certain papers in Ohio making a fervid defense of the Standard Oil Company; and while they did not try to abuse the court, they were abusing the attorney-general and other officers of the court, which meant, in fact, the court. It was said that capital was being driven out of the State; that the Standard Oil Company was liberal in wages; that they had given largely to charity, and that they were also about to donate something to one of the State universities I was handed a contract while I was examining a witness at Marietta, a typewritten contract, that they had negotiated the week before for one of the Marietta papers.

Q. That is, to purchase the paper outright? A. No; the earlier part of this contract referred to advertising the paraffine and other by-products of the company, and then they had six or eight lines which contracted for space on the editorial page, where their matter was to appear as news, and if it did not so appear, or there was any mark of advertising about it, the papers were not to receive any pay For such matter as would be furnished them, by boiler plate and other means known to the newspaper world, they got from 20 cents in the larger cities down to 4 cents in the smaller ones, for news items: and then if the county papers were assiduous in defending the merits of the trust's charitable undertakings they would take thousands of copies of them and send marked copies to proper parties. If you have run across some of your constituents who are being oppressed by the price of oil, they should be satisfied thoroughly by marked copies of Gunton's Magazine and the Sandusky, Ohio, papers.

Q. (By Mr. Phillips.) You do not mean to say that Gunton's Magazine is in favor of trusts, do you? A. If you want to get the best, get Gunton; I think Mr. Tole's speech was there. A leading daily in the State has been having a great many articles in favor of the trusts on one page, while on other pages appeared articles demanding anti-trust legislation, although Ohio has perhaps as stringent a law as any State in the country They were demanding more legislation and investigation. Now, you might say they imagined our trust investigation last winter was done to put off ultimate action. We find that investigations similar to this are very useful in enabling a legislature to get down to bed-rock facts, as in the short session of legislatures no committee can do what you are doing, and when legislation is backed up by public sentiment the law can be enforced. I have aimed not to be partisan in the matter, but I feel that the operation of some of the trusts in Ohio has been so against the average citizen that anything that can be done to relieve them ought to be speedily done.

STANDARD OIL COMPANY AND POLITICS.

Q. Have you any information as to attempted influence of the Standard Oil Company in politics, aside from what you have already explained and aside from any connection with the press? A. Well, I expect it would not be advisable for me to discuss that. Mr. Harris lives in Ohio; he may give you the names of contributors; I suppose we could all give names of people we suspect collect these funds, but I do not want to testify on that.

Q. It may be you can file official papers with us or give us transcripts of testimony in the case of the alleged attempt at bribery of the attorney-general of Ohio? A. I can give you just what I file with the court, when the testimony is through. I shall be glad to give you an official transcript of whatever is taken.

METHODS OF DRIVING OUT COMPETITION.

Q. Can you give us any official information with reference to any other trust organization in the State of Ohio besides the Standard Oil Company? You have already spoken briefly with reference to combinations of insurance companies; can you tell us with reference to any others? A. Before I leave the Standard Oil Company it might be interesting to the commission to speak of the means which they adopt for driving out competitors. Mr. W. H. Clark, of Newark, Ohio, for seven years an employe of the Standard Oil Company in their retail department, would give, I think, full information to the commission on the subject. After he left the employ they arrested him, charging him with embezzlement; they only found this charge against

him, as his testimony showed, after he commenced selling independent oil for an independent company. He has had the same experience as the testimony before our trust committee showed that all competitors have. His sworn testimony is that he sold four grades of oil for the Standard Oil Company out of one tank; that he turned the faucet to the right for one kind, to the left for another; and that if that did not suit the customer he went to the front end of the wagon and switched the faucet there a little. The Standard Oil Company corroborated that a little, except that they said they gave a higher grade of oil than that called for, if they did not have the grade desired, at the same price. That was their defense to it.

They have a plan of sending agents around—I think competitors call them buzzards—where there is competition, to follow up the competitor's wagon, take the name of the customer and the amount of oil sold, and mail it to the central office of the division. A special agent of the Standard Oil Company is then sent out who follows up the competitor, making tests. He will clean up the lamp of the customer of the competitor, make a test, and then leave their own oil of as high a grade as the competitor's. If they can not succeed in that way they then commence cutting rates, and the rates are cut below a living price or until they have driven out the competitor. Then the man who is inspecting and following the competitor goes to another town where they have competition. When they have driven out competition in a given town the oil goes back to the old price. They sold oil for 4 cents at Dayton, where they had competition, while at Urbana it was 8. These towns are but a short distance apart. You will find when you get experts upon it that they not only had the same grade of oil at different prices in the same town at the same time, but that they have had as much as 50 and 60 per cent difference in towns 30 miles apart.

THE TRUST PROBLEM STATED BY LORD COKE.

The experience has been substantially, I think, as Lord Coke put it in that original proposition. I would like that to go into my testimony. He laid down the proposition that every court from that day to this has substantially followed. I cite that case, which is approved, and which is a very good analysis for a commission or a court to go by. It is the old case of Darcy against Allein (Coke's Reports, Part XI, 84 b). He says: (1) "That the price of the same commodity will be raised, for he who has the sole selling of any commodity may well make the price as he pleases." (2) "The incident to a monopoly is, that after the monopoly is granted the commodity is not so good and merchantable as it was before, for the patentee, having the sole trade, regards only his private benefit and not the commonwealth." (3) "It tends to the impoverishment of divers artificers and others, who before, by the labor of their hands in their art or trade, had maintained themselves and their families, who will now of necessity be constrained to live in idleness and beggary."

Q. (By Mr. North.) What is the date of that case? A. It is an old case, two centuries old; it has been cited by all our authorities. It is an analysis of the effect of trusts; you have the benefit of all the courts in England and this country who have followed that decision.

POSITION OF THE ENGLISH COURTS.

Q. Are there any analogous English cases? A. Oh, yes; they commenced in Queen Elizabeth's time by the sale of franchises, by which one person could buy and sell exclusively all of one commodity; and in the case of salt and iron, where court favorites having exclusive control had become so rich and arrogant in dividing with sovereignty, the courts, independent of parliamentary acts and independent of precedent, revoked their charter, or individual franchise, for it was then called a franchise. Since then, if you look down through the reigns of the Georges and Victoria, you will find that they have had parliamentary legislation and court decisions down to date against monopolies. Under some parliamentary acts they have sustained a limited monopoly. In transportation you will find England has sustained what we call pooling, but under our decisions pooling is as obnoxious as any trust. The steamship companies have succeeded in getting a parliamentary act relating to pooling in rates that has been sustained.

Q. (By Mr. Jenks.) In the Mogul Steam Navigation case?

Q. (By Mr. North.) Have you any knowledge of the methods of the German Empire in that case? A. No; nothing more than a text-book knowledge, the same as you have access to. You have access to all that.

Q. (By Mr. Jenks.) Can you take up the case of some of the larger companies that you have brought suit against? A. Well, I have brought suit against the brewery trust of Cleveland.

PRESENT STATUS OF TRUST LITIGATION IN OHIO.

Q. (By Mr. Phillips.) Before passing to that, would you be willing to give to the commission the present status of the litigation against the Standard Oil Company in your State? A. The Standard proper of Ohio, as I said in the beginning, has a decree against it; it is an adjudication that it is a trust in Ohio; that it is a scheme or system whereby the stockholders or a majority of them entered into this combination, and that their act is the act of the company. The corporate fiction will be ignored when the acts of the stockholders accomplish corporate oppressions, and so far as this one company is concerned, which was the only one party to the original contract, it is a denounced contract. The violation of the decree, their failing to withdraw from the trust, is what the contempt proceedings were instituted for under the order of the court. We have taken the testimony of Mr. Rockefeller by in-

terrogatories, also parol testimony of about two days, and the testimony of F. B. Squires and that of John D. Archbold. We took the testimony of numerous other witnesses outside of this suit. The company refused to give substantive testimony from their commercial books, and the officers so refusing are now before the court under a charge of contempt. The evidence is being printed and submitted, and the case will be heard probably in the second week of June. The punishment for violation of the original decree can amount to any fine that our supreme court sees fit to inflict commensurate with the wealth of the client or defendant. It could amount to $700,000 if the court chose to inflict so much of a penalty. I think it is deserved, and I am maintaining that the punishment in contempt, besides a fine, could extend to taking the charter away without further action. But as there is no precedent for taking a charter away as punishment in contempt, we have an independent action for that purpose against the Standard Oil Company of Ohio, charging them with additional offenses. Now the later suits were commenced for the purpose of forfeiture of the charter and the testimony taken in those proceedings is quite volumnious. We have a suit pending against the Buckeye Pipe Line Company under the charges I have related to you, with a large amount of testimony taken, and witnesses are now before the court for contempt for refusing to answer questions submitted to them. So that the executive department, the attorney-general's office, has presented the testimony up to the point where the court will have to decide what they can be compelled to answer. Their defense is that it is violating the Federal Constitution as well as that of the State to compel them to disclose their acts of a private nature. We contend that when the sovereignty inquires into the acts of its creatures it does so in accordance with the visitorial power which is reserved to the State, and that it is simply a legal anomaly to say that the government can create a creature and then not control it, just as the national banking act permits the National government to investigate the banks. So that if the contempt proceedings are heard in June—and I think they will be—and if we are successful and the officers of the company are held in contempt, they will incur the penalty. Mr. Rockefeller's testimony has disclosed the amount, more than half, of the trust certificates that the stockholders have redeemed up to the filing of the petition, in November, 1897. We should then be in this condition: We should have the transportation department for the crude petroleum of all the other companies that do business in our State under control, and it should be in the hands of a company that would permit competition and an open and equal chance to all producers.

Q. (By Mr. North.) As a result of winning your pending suit? A. Yes; the Standard Oil Trust or the Standard Oil Combination could not exist without the control of the transportation of the crude petroleum and this suit aims at the very heart of the trust, namely, the transportation department. It would effectually control it. It needs no further legislation. The National Congress can not regulate it so far as Ohio is concerned, because it is an Ohio creature, but so far as inter-state business is concerned you would have jurisdiction over that. The remedy is primarily with the attorney-generals of the various States where the charters are granted. The attorney-general of New Jersey could solve this question in sixty days if he would take the charters away from New Jersey companies that are violating the public policy of the country, viz, that no creature of the government can use its power to the injury of the government or to the injury of the people.

Q. Do you believe that the Federal Government can accomplish anything through the jurisdiction over the corporations created by one State and doing business in a great many others?

WITNESSES IN TESTIFYING SHOULD NOT BE HELD TO INCRIMINATE THEMSELVES.

A. You have been having that fought out in the Supreme Court of the United States in the Stockyard Cases. They held they could not. The Addyston Steam-pipe Case, that is now being argued, is on the same point; but all corporations, like the Union Pacific, that have been created by the Federal Government and are doing inter-state business, are reached by the Sherman anti-trust act. Michigan, I think, has adopted an anti-trust act similar to ours this year, but introduced a clause like that in the inter-state commerce act, which provides that any witness testifying concerning a trust shall not be held to criminate himself, and the testimony so given can not be used against him. The United States Supreme Court has said that this exemption shall be given to a witness, and that any testimony that he has given is a privileged communication, the same as it would be before a Congressional investigation like this. That will prevent a witness from stating, as they do in case of material testimony, among other objections, that it tends to criminate them. The Standard Oil Company refuses to give testimony now in Ohio because the testimony would tend to criminate the officers. But that Michigan clause will forbid the witness from using that constitutional prerogative by making it a privileged communication, and all trust laws should contain that clause.

Q. (By Mr. A. L. Harris.) Which State report is that oil case in? A. Forty-nine, O. S.

Whereupon the commission took a recess until 2 p. m.

Washington, D. C., Tuesday, May 16, 1899—p. m.

Hon. Frank S. Monnett again on the stand and examination resumed:

Q. (By Mr. Phillips.) Does any member of the commission desire to ask any questions?

Q. (By Representative Otjen.) What did I understand to be the income, the profits, of this trust in Ohio during the year? A. The gross receipts from non-competitive prices would be 120-odd million dollars; and, taking the best information as given before our various investigations that the refined oil could be-

livered in Ohio for less than 4 cents a gallon, it would make a net profit on the Ohio oil, which is about 40 per cent of all the oil produced in the United States, in the neighborhood of $50,000,000—$50,000,000 to $53,000,000.

OIL CAN BE RETAILED IN OHIO AT FOUR CENTS.

Q. Did I understand you to say that it is your opinion that the oil could be sold in Ohio at 4 cents a gallon; that that is about the cost price of oil? A. It can be retailed at 4 cents in Ohio at a profit.

Q. At 4 cents? A. Yes; 4 cents. There is testimony placing it at a point even below that. Is that too low a price?

Q. That is the refined oil? A. That is the refined oil. There was testimony that the cost was lower than that; but that is for the refined oil.

Q. In places outside of Ohio there would simply be in addition the cost of transporting it? A. Yes; the cost of transportation depends usually upon the arrangements from the distributing centers with the Union Tank Line Company.

Q. Of course in some places it would be higher than in others? A. At water points like New Orleans and New York, where they meet the competing water lines, the rates are much lower than they are e. g., 150 miles north of New Orleans.

Q. Is that true of such places as Detroit, Chicago, and Milwaukee? A. Yes; as compared with such points as Duluth, Detroit, Milwaukee, Buffalo, and Cleveland, you will find, if you investigate any transportation department, that the rates on all commodities at inland points are much higher, as a rule. In other words, the low through freight rate is made up by charging excessive local rates; and that is true of oil as well as of other commodities. The competition—from testimony before our railroad commission last winter—of the Canadian Pacific, a subsidized government road, compels our roads, in order to compete, to make a cheaper rate per ton per mile than they have had where they did not come into direct competition with the subsidized railroad, and when they are practically below cost at a competing point they must make that up at inner shipping points, so that there is discrimination against inland States like Ohio, Indiana, and Illinois, so far as the local shipping is concerned, to keep up the general average.

THE CHARGES OF BRIBERY AGAINST THE STANDARD OIL COMPANY.

Q. (By Mr. Kennedy.) I should like to ask the witness whether he has any knowledge of attempts by the Standard Oil Company to interfere with judicial proceedings against them by resorting to bribery? A. As I said to the commission this morning, the bribery charges made against them are made officially in a complaint in the Supreme Court, beginning with General Watson, naming the parties, and bringing the case down to myself. I will furnish the commission the data we have alleged and set forth therein, with their answer and motion and my supplemental complaint, and when the testimony is taken, which will no doubt be kept in record, I will furnish the commission that also, if it is desired. To go into the merits of the pending case I do not believe advisable. It is a matter purely with the court—a contempt matter—and will be furnished from our office just as it transpired. Mr. Watson,I suppose, will be ordered to testify before the commission at an early date. I can give you the testimony that was adduced, showing that they purchased competitors" clerks at times to furnish them, clandestinely, information as to the working of their competitors. At Cleveland, Ohio, a Scofield, Schurmer & Teagle man was to get so much a month for furnishing their rivals information. He was to furnish the amount of oil shipped, the names of the customers, the cost price, and all the details every evening to the Standard Oil Company. These arrangements were made by John Squires and afterwards by B. F. Squires, according to sworn testimony.

Q. Were they successful? A. The one I have described was partially successful. The man was bought up in some way—I do not know how—was found out. At least, he gave up the information to his employer. Testimony might be furnished to you of the witnesses in reference to Jenning's Advertising agency. That system is in vogue all over the State; wherever they can successfully do so, they employ an agent or employe of a rival company. There is one instance where an employe at the railroad station was to leave the information at a given saloon near the depot, where the Standard Oil agent gathered it. They jump onto the wagons that are hauling oil and ascertain the destination of their rivals' oil. This information is all furnished to the Standard Oil offices. They get such information free from the agents of the railroads, if they can, and if they can not they get it from others. I do not know whether you call it proper, and whether a man is at liberty to sell his time and inform the Standard Oil Company of what is going over his railroad. I suppose there is no criminality about that; yet it would be bad ethics in a postmaster to permit such information to be furnished through his employes. The Squires's bribery of a clerk was the only case of hiring rivals' clerks to furnish the data. This was brought out in court in a contest between Scofield, Schurmer & Teagle and the Standard Oil Company. Mr. Brown, of Cleveland, can give you the names and further details on that subject.

EFFECT OF PIPE LINES ON FREIGHTS.

Q. You spoke this morning about railroads in Ohio which have pipe lines paralleling them, and which are in league with the Standard Oil Company, to the detriment of independent small producers. I do not understand that you were specific in regard to these railroads. Can you be now? A. I did not put it in that way. I said that only as a deduction, viz, that where a pipe line company had been run parallel to a railroad company—I was speaking of the conducting of the whole business—that the records would show that the freights for shipping oil were raised after they had a competitor in a pipe line. The natural result would ordinarily be that severe competition by the pipe line

would bring railroad rates down lower than they were before. You can draw the inference from this that through some arrangement the rates, instead of being lowered by competition in these particular cases, were raised. I am basing that, of course, upon testimony.

Q. Do you care to say what railroads? A. I think when that came out that the Erie was spoken of; the C. & M., down by the Macksburg oil field, was one of the companies; and the Lake Shore, I think, was charged with that in a contest in which Virgil P. Kline was fighting the Lake Shore for discrimination in rates.

REDUCTION IN THE PRICE OF OIL NOT DUE TO THE STANDARD OIL COMPANY.

Q. (By Representative Otjen.) It is claimed by the Standard Oil people and their advocates that by their combination and improved business methods they reduce the price of the oil product. What is your information upon that subject? A. That is the favorite argument of Mr. Dodd and others. Calico ran down from 75 cents to 4½ cents per yard, and they might as well have credit for it; and we used to haul wheat by wagon for $10 a load across Ohio, where they now ship it for a small fraction of a cent per ton per mile. I think that they, like every other producer, had to keep within reasonable bounds in their prices, but they have been profiting at the rate of millions out of non-competitive rates, notwithstanding the price was reduced. I think they are not entitled to the credit of the reduction because of improved methods or the great amount of oil discovered, any more than of the reduced price of any other commercial commodity. I present here a table which shows the Standard Oil Company's prices of kerosene and gasoline from tank wagons on the same day at different towns in Michigan and Ohio, where they had competition and where they had not. The figures for towns in Michigan are taken from the sworn testimony furnished our trust commission last winter. The figures for Ohio towns were prices in 1896.

Names of Towns and State	Conditions of Trade	Price of Kerosene	Price of Gasoline
		Cents	*Cents*
Detroit, Mich.	Competition	5.5	7
Adrian, Mich.	No competition...	8	.....
Ann Arbor, Mich.	" "	7.75	.....
Clifford, Mich.	" "	8	.....
Howell, Mich.	" "	8	.....
Grand Rapids, Mich.	Competition	5.5	6.25
Monroe, Mich.	No competition..	7.5	8.75
Kalamazoo, Mich.	Competition	5.5	.....
Bay City, Mich.	No competition..	7.75	.....
Lansing, Mich.	Competition	6	7.25
Coldwater, Mich.	No competition..	8.25	.....
Jackson, Mich.	Competition	6.5	7.75
Saginaw, Mich.	"	6	.....
Mount Clemens, Mich.	No competition..	8	8.5
Marlette, Mich.	" "	8	.....
Muskegon, Mich.	" "	8	.....
Battle Creek, Mich.	Competition	6.25	.....
Benton Harbor, Mich.	No competition..	7.25	.....
Cleveland, Ohio.	Competition	4.75	6
Sidney, Ohio.	No competition..	8.75	10
Dayton, Ohio.	Competition	6.5	6.5
Xenia, Ohio.	No competition..	8	.....
Hamilton, Ohio.	" "	7.5	.....
Oberlin, Ohio.	" "	7.5	.....
Troy, Ohio.	" "	7	.....
Youngstown, Ohio.	Competition	6	.....
Canton, Ohio.	"	6	.....
Warren, Ohio.	"	5.75	.....
Galion, Ohio.	No competition..	8	.....
Newark, Ohio.	" "	8	.....

Since this table was first published, at Newark, O., and since we took testimony exposing the Standard Oil Company's practice of charging three or four different prices for oil out of the same tanks, competition has come in and the price of oil has been reduced to four cents.

Q. It is your opinion, then, that the lowering of prices has been due to other causes than any which could be attributed to the Standard Oil Company? A. The Standard Oil Company has taken advantage of each improvement for refining or handling oil. They seized upon, as every other commercial institution would, the improvement that would bring profit out of the by-products. Then there has been a great improvement in methods of boring for oil, and the pipe line system, which was originally introduced by other parties than the Standard Oil Company, has simplified the method of transporting the crude product. The tank-car system has been a big improvement in saving the use of barrels. If the government protects these giants, it must keep competition open so that they will compete with one another just the same as small men compete with one another. The eternal law of competition will prevent the excessive profits and greed that the government does not seem able to prevent when a monopoly is fostered through exclusive grants in the transportation department.

COMPETING COMPANIES IN OHIO.

Q. (By Mr. A. L. Harris.) What companies are competing with the Standard Oil Company in Ohio now? A. There is only a limited competition; I think Scofield, Schurmer & Teagle; and a man by the name of Peter Shull, at Mansfield, has an independent agency, but only a limited territory. Scofield, Schurmer & Teagle originally had a contract whereby they were limited in the amount they were to sell to what would enable them to live.

Q. They have competition with more than that? A. They have competition, but it is not a successful competition either with regard to the pipe lines or the tank line. Neither is competition in rates successful, according to the claims of competitors.

Q. How do they get clear of the competition of the small companies in Ohio? A. If you take the testimony of Senator Davis you will get more accurate information on that question. I have to do more with the legal phases. One way is that which I have nar-

rated. They have what their competitors call "buzzards," who follow up competitors, as I have explained; and they have had for a long time several rates, or various favorable rates, with the railroad companies. They soon became strong enough through this means to control a part of their territory and to sell at a non-competitive price, or a price high enough to enable them to establish a competitive fund. In this way and through their advantage in the transportation department they were able to undersell and run out small men.

Q. Have they followed up the fields in Ohio? A. Yes; I understand they have, which is perfectly logical so far as that enterprise is concerned. They have expert prospectors who are always on the ground the minute that a field is discovered. With their system of transportation, under their own control, they determine the value of the well and can get pretty nearly the lion's share for their portion.

STANDARD OIL COMPANY CONTROLS THE PRICE OF THE CRUDE PRODUCT.

Q. Even in the new field they substantially control the price to the producer of the crude oil? A. Certainly, certainly; Senator Davis will give you an account of the plan whereby they shut out the producers in the Corning field by raising the freight rates 17 cents per barrel. They ship and condemn oil according to their own methods and fix the price according to their own standard. The oil market price, which is under the combination's control, is sent out from Oil City every morning to the oil fields.

Q. Is there any indication at present of the old system of rebates that they once had? A. On the Lake Shore? No; they have various freight rates. You will find, when you get into the transportation department, that favorite railroads get some advantages. They do not need to resort to the old-style rebates. They can charge their own prices, which amount to rebates, when they own the pipe line or own a controlling interest in the railroad.

Q. (By Mr. Farquhar.) What portion of the crude product of the United States does the Standard Oil Company itself own? A. Well, according to the testimony, they control, either directly or indirectly, from 90 to 97 per cent. of all the crude product. That, of course, I get only from the testimony; I have no means of gathering the data.

Q. Of that 90 per cent., do you know how much they own? A. How much they own?

Q. Own. A. No; I do not personally know. Ninety per cent. is the estimate; 90 per cent. is the lowest estimate of the amount they control.

Q. That is, you mean by the expression "control" that they have control in purchasing the crude oil from others. But the question I asked was, Do you know, can you approximate, how much the Standard Oil Company directly own of the crude oil product? A. No; I cannot furnish you with that data.

Q. Would you think it was half? A. I should think it was a great deal more than that.

Q. (By Mr. Phillips.) That is, in the Ohio field? A. I know it is a greater per cent. than that in the Ohio field. If they have control of the transportation from a new field, they do not need to own any of it, so far as the producer is concerned. If they determine how much they are going to pay for it and are not satisfied they can fix the producer's price at whatever it costs to produce, simply living wages, and let him bore and worry over the cost of getting it from the rock.

Q. (By Mr. Farquhar.) As a business proposition, is it not in testimony that they only own 75 per cent. of the whole product?

Q. (By Mr. Phillips.) Does not that refer to the Pennsylvania and the Virginia fields—to what is known as the white-sand oil—and not the Ohio?

RELATION OF THE STANDARD TO INDEPENDENT COMPANIES IN FOREIGN MARKETS.

Q. (By Mr. Farquhar.) I understand that, but you speak of their control. Is it not true that the independent companies, independent pipe lines and others, have and exercise a certain freedom in selling their oils in foreign markets and otherwise, independent of the Standard or independent of its practices? A. When you come to the question of their relationship with the steamship companies, the interests they have in them, the arrangements they are enabled to make through acts of the British Parliament, the way they head off the Russian oil, etc., you will have to get witnesses that know. All you can observe is the result. There is a little book, recently published, which will explain the way they manipulate the English oil market and give you the details more accurately than I can give them.

Q. (By Representative Otjen.) What is that? A. It was handed to me while Mr. Archbold was on the stand in New York. I do not remember the name now, but can furnish it to you.

Q. (By Mr. A. L. Harris.) Is Cook the author? A. No; it was a little red book, a pamphlet about four by six inches, and contained all the testimony as to how they managed to control the Russian oil market, *i. e.*, I mean prevent the Russians controlling the English market.

Q. (By Representative Livingston.) Whose testimony is it; I do not understand? A. It is simply a pamphlet, prepared by someone, that is circulating in England. It gives the history of the Standard Oil Company's control of the English market.

Q. I would like to know something official. Of course we cannot receive that book as an official statement. A. I cannot give you that book's source of information.

Q. Which line of steamers is the Standard Oil Company interested in? A. You can get hold of all the information relating to their entire system of water transportation, as well as their system of land transportation. There are witnesses than can furnish you that. If you get some of the independent oil dealers in New York that are competing by water (there are three or four firms down there), they will inform you.

Q. (By Mr. Phillips.) Are they all independent re-

finers? A. They are independent refiners; they have not their pipe lines quite through to seaboard. They have been able to have their system of pipe lines, like the Standard, but they have competitors there. Of course there is no way of controlling a water highway except through the methods of shipping, viz, classification of freight.

Q. (By the Chairman.) Does any member of the commission care to ask anything further? A. It would be impossible by means of my investigation to reach anything outside of what we came in contact with ourselves, but you will find it all. There are people, or witnesses, who will furnish you that.

Q. (By Representative Livingston.) Do the independent refiners have any arrangement with the transportation companies by which they can compete across the water with the Standard Oil Company? A. That I cannot furnish you; you can get that, however. I understand they ship oil "camel-back" and almost every other way in the old country. In some places they have a fair competition, and in others, we think, they do not. So far as Ohio and the United States are concerned, the secret of the difference between their success and that of the others lies in their gaining control, as the testimony has shown, through the powers they receive from the government and through the transportation companies. That is my theory of it.

COPIES OF STOCK AND TRUST CERTIFICATES.

Q. (By Mr. Jenks.) You said this morning that you could furnish a copy of the trust certificate issued to the certificate holders under the old trust form. Can you also furnish a copy of the stock certificates that they issue at present to the stockholders? A. I think so. [showing book.] Here is a lithograph copy of the Standard Oil Company's capital stock certificate after they increased to $3,500,000. Do you care to have it read? That is one of the stock certificates.

Q. Make that a part of your testimony with one of these other similar forms. A. There are two of these here, and then I have here also a printed form of the trust certificate. They do not always put the exhibits in connection with the testimony, and you have to look for them at the close of the testimony. Here it is on Page 51 of Part II of the Record in the case of the State of Ohio *ex rel.* the Attorney General vs. the Standard Oil Company. Well, Mr. Rockefeller's own personal one is here, and that will give you an idea. (Reading)—

STANDARD OIL COMPANY.

No. 301. Capital, $3,500,000. 9,244 shares.

Incorporated under the laws of the State of Ohio.

This certifies that J. D. Rockefeller is the owner of ninety-two hundred and forty-four shares of the capital stock of the Standard Oil Company, transferrable only on the books of the company in person or by attorney on surrender of this certificate.

Witness the seal of the company and the signatures of the president and secretary, at Cleveland, Ohio, this 28th day of November, 1892.

(Signed) J. D. ROCKEFELLER, President.

(Signed) F. B. SQUIRE, Secretary.

(Seal.)

(Standard Oil Company,)
(Cleveland, Ohio.)

(Reading.)

Know all men by these presents:

That we, John D. Rockefeller, Henry M. Flagler, William Rockefeller, John D. Archbold, Benjamin Brewster, Henry H. Rogers, Wesley H. Tilford and O. B. Jennings, trustees for winding up the Standard Oil Trust, by W. H. Tilford, our attorney in fact, and John D. Rockefeller, of —— ——, do hereby constitute and appoint John Bensinger, of New York City, our true and lawful attorney for the purposes following, to-wit:

Whereas, John D. Rockefeller has placed in the hands of said attorney assignment No. A 365 for $\frac{25}{97}\frac{68}{25}\frac{54}{00}$ of the amount of corporate shares held by said trustees on the first day of July, 1892, in each of the companies whose stocks were so held.

Now the said attorney is hereby authorized to secure from each of said companies transfer upon their corporate books of said stock and stock certificates for whole shares, and scrip for fractional shares thereof, and when the said certificates and scrip are received from all the companies referred to the said attorney shall deliver the same to John D. Rockefeller, and the said assignment of No. A 365 shall at the same time be delivered to the said trustees.

And the said attorney hereby agrees to obtain the said certificates and scrip and to deliver the same and the said assignment as above specified.

(Signed in print.) JOHN D. ROCKEFELLER,
HENRY M. FLAGLER,
WILLIAM ROCKEFELLER,
JOHN D. ARCHBOLD,
BENJAMIN BREWSTER,
HENRY H. ROGERS,
O. B. JENNINGS,
WESLEY H. TILFORD.

(Signed in ink.)
W. H. TILFORD, Attorney in Fact.
JOHN D. ROCKEFELLER, per Geo. D. Rogers.
JOHN BENSINGER.

Q. This is the form of the stock certificate in lieu of the trust certificate? A. They authorized him to transfer that, and then he received from the constituent companies, the 20 companies I mentioned to you this morning, his share of each of those. All those forms are here, if you care for them. The correct trust certificate is here also. I do not suppose you care to have the legal intricacies; they show how they got out of the trust and how they got into it. On Page 125 there is a copy of the Standard Oil stock certificate.

That was the original trust certificate, or copy, then, of 34,993 shares, or 35,000 shares less the seven shares.

THE CONTRACT WITH THE NEWSPAPERS.

Q. That will be sufficient, I think, along that line. You spoke this morning also with reference to the contract that was made by the Standard Oil Company or its representatives with some of the newspapers. Can you furnish us with a copy of that contract or give us its substance? A. Mr. Cook gave the first testimony at Marietta on this point. The testimony that was afterwards given was in reference to the Xenia Herald's contract. George W. Cooke, of Marietta, has given the essential parts of it here, I notice, in his testimony; and I think I can furnish it to you from the record.

Q. Will you be kind enough to quote that accurately as it was given in the testimony? A. I thought I had the page showing some of the publications for which he received pay. Here I see his exhibit (reading): "Whether the Standard Oil Company of Ohio is in a trust or out of a trust is a question for the courts to decide; but whether the consumers of oil are getting a better quality at less cost and handling with greater safety than formerly is a question for the people to decide. In the commercial affairs of life it is things, not words, that count in making up the balance sheet of loss or gain, of benefit or injury. Monopoly and octopus, combines and trusts, are haughty words, but the best goods at lower prices are beneficial things. It is much easier to say harsh words than it is to make good things cheap."—*Lima Times-Democrat.*

Q. This material was furnished by the company? A. Furnished him by the company. I see here on Page 82 of the typewritten copy of Mr. Clark's testimony (reading): "The publisher agrees to reprint, on news or editorial pages of said newspaper, such reading notices set in the body type of said paper and bearing no marks to indicate advertising, as are furnished from time to time by said Jennings agency, at the rate of —— per line, and to furnish such agency extra copies of paper containing such notices at four cents per copy." To be fair to the company, a little bit of newspaper controversy arose. They claimed that in that there were two words left out, and it proved to be so, for afterwards when we obtained the original contract the words "acceptable to the publisher," were left out; in his testimony here those words do not appear, and therefore it was claimed in the Jennings suit that this contract was not correctly copied. But although the printed form did not contain the words "acceptable to the publisher," it made no difference in effect, for the subject matter published must have been acceptable or it would not have been published.

COMPETITION WITH THE STANDARD.

Q. (By Mr. Phillips.) Some time after the discovery of the limestone rock, or what is denominated as Lima or Trenton limestone rock oil, did or did not the price settle to 15 cents per barrel, more or less, for a year or so after it was discovered? A. That I do not know. As to such details the active dealers can give you them. The temporary glutting of the market would reduce the profits until it became regulated again.

Q. During the time of the Standard Oil Company's control independent pipe lines have frequently been built in the different fields, have they not? A. Yes.

Q. Do you know by what methods they undertook to compete with these independent pipe lines? Was it by reducing the pipage of the oil, or by putting a premium on the oil piped, or both? Do you know? A. Sometimes they temporarily raised the price to producers so that in the producing field the competing pipe line company could not pipe the oil temporarily at the price; and in other cases they would watch that pipe line company's refining customers and would break them up when they sold the refined product. Mr. Davis has had sad experience in that line; he can give you the details of that.

OTHER COMBINATIONS' PROFITS NOT SO GREAT AS THE STANDARD'S.

Q. Do you know of any other company, corporation, trust or monopoly in recent years that has made such a vast sum of money as has been made by the Standard Oil Trust? A. The nail trust ran up the price of nails, until the company cleared a large amount of money in a few months.

Q. I mean, made it in hand, accumulated the fortune? A. The nail trust ran up nails from 86 cents to $3 and something, and they cleared $7,000,000 in a shorter time than the Standard would have made a similar sum.

Q. I have alluded to the larger accumulations. A. Oh, no; none that I know of.

Q. Can you summarize briefly what methods they have pursued? You have passed over a number of them. Could you summarize to this commission what methods they have pursued to secure this fabulous sum of money?

Q. (By Representative Livingston.) You mean the nail trust?

Q. (By Mr. Phillips.) No, no; the Standard. A. You will have to obtain those facts from the men who come in contact with their methods; beginning with the Pennsylvania road and the freight blockades and the pipe line fighting, and coming up to the fights they now have in the courts. It would be impossible for me to give you accurate data. I expect Mr. Phillips here can give you some points on that fight. There are several witnesses you can get upon that point. I suppose Mr. Lee could have given you something; I understand he has testified.

STANDARD OIL COMPANIES IN DIFFERENT STATES.

Q. (By Mr. A. L. Harris.) In what State did the Standard Oil Company get the charter under which it is operating now? A. The Standard Oil Company of Ohio is chartered under Ohio laws; the Standard Oil Company of Indiana is chartered under Indiana laws. There is also a Standard Oil Company of Penn-

sylvania. The Buckeye Pipe Line Company is of Ohio. The Union Tank Line is a New Jersey corporation. I suppose there are ten or twelve States represented. If you want to know why we let the trust live in Ohio, it is because we cannot help ourselves.

Q. (By Mr. Farquhar.) You proceeded against the company under the Ohio law? A. The Standard Oil Company, not the trust. I will write out a list of the companies for you. They are in different States, but all act together to accomplish a common result, viz, to make the trust certificates valuable. The original contract was denounced by the court, but it still bears fruit in dividends collected by holders of trust certificates.

DISCRIMINATIONS IN FREIGHT RATES WITHIN A STATE.

Q. (By Mr. A. L. Harris.) I thought they were incorporated in the different States? A. On Page 26, in this report, Mr. Harris, there are some tables in reference to the advancement of freight rates growing out of the competition in oil. This is our Ohio trust investigation report and shows where they increased the freight before and after a certain period from 16½ cents in 1888 to 19 cents in 1898. On the Rock Island road they increased the rates from 18½ cents in 1888 to 29½ in 1898. These tables can be furnished you, and they will show you the discrimination against independent shippers. The freight was increased for the independent companies, when compared with the rates in force when the Standard was shipping by railroad.

Q. (By Mr. Farquhar.) In your investigation of these affairs did you ever find that the railroad charter regulates freight charges? A. We have a statutory freight regulation; a maximum rate.

Q. Maximum rate? A. They cannot charge more than so much per ton per mile for certain specified commodities; in that sense, I mean.

Q. In what sense? A. The fixed rate is as high as five cents a ton per mile. The competitive rate for coal to Duluth has been as low as one-seventh of a cent a ton per mile, so that the statutory rate of many years ago has practically given no protection to the shipper in recent years.

Q. If an Ohio road delivers coal at Lake Erie at a lower rate for a long haul than for a short one, provided it must do this to get the extra tonnage needed in order to pay dividends and make profits for the road, if it still keeps under the maximum rate, do you call it discrimination? A. What I referred to especially may be illustrated by facts. The town of Nelsonville, which is perhaps 60 miles below Columbus, has received the same kind of groceries or freight from Baltimore at a rate no greater than they were charging from Columbus. In other words, the wholesale grocers of Baltimore were able to compete with those of Columbus because of the discrimination in the transportation of freight. By means of through freight rate discriminations like this great terminals such as New York and Chicago are placed upon a competitive basis with the inland cities. That is the most extreme case that we have. There was another case where the total charge for shipping coal from the Hocking field to the Dayton asylum was the same as the rate, over a road controlled by the same company, to Sandusky City, and through, I think, to Duluth. But these figures on coal discriminations can be furnished you from freight-rate tables, *i. e.*, within the State; there is no law against discriminating on long and short hauls. We contended, by a bill before the Legislature, which was defeated by a strong lobby, that the rate for State roads ought to be based upon the inter-state rate, and that we ought to have the same rate per ton per mile on our State business that the Inter-State Commerce Commission requires on inter-state business. We fought for that very strongly, but were defeated. Our theory is that while it is nesessary to maintain corporations by an income sufficient to bring proper return for investment, and while it is conceded by everybody that corporations are a necessity and that we should not be hostile to them, the State commerce should not be levied upon in short hauls in order to reimburse companies for their losses in competing at waterway terminals. Or, in other words, they ought so to distribute their charges as to equalize them between the inland cities and the terminal points.

Q. Can a railroad, chartered in Ohio and under an Ohio maximum freight rate law, make rates independent of the inter-state commerce rates themselves? A. Yes.

Q. The same as the constitution of New York with the New York Central? A. Yes.

Q. (By Representative Livingston.) I suppose the Standard Oil Company and independent refiners get special rates on oil that they ship? A. That is a pretty severe charge to make against any railroad.

Q. I am not making any charge; I am asking you a question. A. I suppose the independents do not get the same rates as the Standard does.

Q. Which do not get as much? A. The independents do not get as favorable classifications of freight. The Standard is always getting rates through some special classifications, or allowances for loading and unloading, or in contracts for lubricating oil, etc.

Q. Oh, yes; they could get all the oil facilities. I believe the independent refiners are fighting the Standard Oil Company? A. That may be, but at many disadvantages. I do not think they have an opportunity to fight; it is not a fair contest.

Q. It is a contest of some kind? A. Yes.

PRICE OF OIL WOULD BE REDUCED WERE IT NOT FOR THE STANDARD OIL COMPANY.

Q. If the Standard Oil was destroyed would the price of oil to consumers be reduced? A. Most assuredly.

Q. Would not that reduce the price from the independent refiners to the consumers also? A. I presume it would.

Q. What interest have the independent refiners in fighting the Standard Oil Company? A. Because there is a legitimate profit to be made in the business, and all they ask is that the government keep its hands off, and not use its power to assist the Standard people.

Q. You are against the protection of the Standard

Oil Company by the government? A. I am against any corporation getting assistance from the government to the exclusion of others. Everybody is entitled to the same privilege.

TRUST FOSTERED BY THE GOVERNMENT.

Q. Do you call that protection or subsidy? Or what would you call it Is it help? A. It amounts to this: Does a sovereign State have the right to delegate governmental functions to a transportation company, be it a railroad company or a pipe line company, and when such a company has received such powers through its charter and by the exercise of the right of eminent domain has condemned private property for public uses, ought the State to permit it to devote that property to private ends? It is manifest that this contract with sovereignty requires such a corporation to give every man the same opportunity to use the railroad or pipe line. There are no powers delegated by a government such that one man can take advantage of another, if the governmental functions so granted are fairly exercised. The board of directors of a railroad who are exercising the right of eminent domain have no more right to give you or me a rebate, to the injury of another shipper, than the county treasurer would have to charge us one mill or two mills and in turn give me back half my taxes. It is just as much an offense for men to exercise these governmental functions wrongfully as it would be for a taxing officer to give rebates in taxes. That is our position.

Q. Your position is that, it being a public franchise given by the State, all the cities of the State are equally interested? A. That is it exactly. The board of directors of a railroad company is exercising governmental functions as much as a Congressman is. As I said this morning, if a man is coining a dollar for the government he has no more right to cut it in two and put half in his pocket than a board of directors has to organize a railroad and exercise the right of eminent domain over private property and then afterwards abuse the right thus granted by fostering a monopoly. And there is where, if you allow me, the modern remedy that is being advocated of absolute government ownership is a mistake, because the government owns them now in the sense that the government can control. They get their life from the government; they have sovereignty breathed into them by the government; they can not exist without the government; they can be destroyed by the government at any time.

Q. Is the only wrong which you charge against the Standard Oil Company that of discriminating against some of the cities of your State as compared with others? Is that the only wrong they are guilty of in seeking discriminating freight rates? Is that all the wrong? A. Oh, no; that is the basis of their getting the advantage. We say they get the advantage from the government by charters, the powers of which they abuse. That is one of the wrongs, but that is not the only offense committed by them.

THE REMEDY FOR THE EVILS OF THE TRUST COMBINATION.

Q. How would you remedy that wrong if you were on this commission and were asked to suggest a remedy? A. If I were on this commission, I should say that so far as State charters are concerned, that is a matter for State control; an offense against a State charter is a subject for State punishment. The States originally ceded to the Federal Government certain powers only, and reserved unto themselves all that they did not so cede. One of the powers reserved to themselves is that of granting charters to incorporated companies, and this is peculiarly within their rights. When you come to corporations that are doing inter-state business, then your commission can step in, and you have the right to investigate that and Congress to control that by Federal legislation. Attorney-General Griggs was right, and so were President Harrison and President Cleveland, when they enunciated the doctrine that the remedy is peculiarly a matter within the State's control.

Q. I have brought you right down to the point again. Would you do that by levy and sale, or by condemnation of the stuff when you catch it on the train, or how would you reach it? Suppose, in inter-state commerce, that a Standard Oil tank was going across from the State of New York to Virginia, and we knew it and seized it in Pennsylvania, and that, after that, the tank of oil, being in possession of the marshall or sheriff, was condemned or confiscated. Would that be your remedy? A. The Sherman Act was pretty nearly that drastic; it would be a good remedy. The Sherman Act has been sustained, and it has gone that far. If a desperate remedy is required for a desperate case, and that proved to be hard, and you enforced it on the dealer, the roads would get a modification of the law; but I do not think anything is too severe to stop the abuse that is going on.

Q. Suppose the tank was condemned and the engine and cars hauling it were all condemned and confiscated; would you think it would break up the evil? A. I should think it would break it up, but I do not believe it necessary to be that severe. I would not interfere with all innocent shippers on the train. You may have mail and express and through freight. Here a punishment of an especial character is needed; take the property that is involved in the offense. If it is the buyer, why, stop the buyer; if it is his oil, stop the oil.

Q. That would be a punishment upon the party that owns the oil, but none on the railroad? A. Then, where you have your through railroads or inter-state roads, take the charter away.

BETWEEN THE FEDERAL AND STATE GOVERNMENTS AN ABSOLUTE REMEDY IS EVER PRESENT.

Q. That goes back to the State authority? A. It goes to the United States if you have a Federal

charter. The Union Pacific has a Federal charter. Between the Federal government with a Federal charter and the States with a State charter there is an absolute remedy ever present and never divested from the people; it is constitutional; the legislature cannot take it away. In our State private property is ever held inviolate by the constitution. The attorney general, to illustrate, is a constitutional officer, and it is his duty to appeal to the courts to forfeit every charter the powers of which are abused, independently of the court's ordering him to do so. That is, he does not have to get a form of written order from the governor, or the legislature, or the court. By the constitution the power is vested in him to bring before the highest tribunal any corporation so offending, as much as the prosecuting attorney is vested with power to bring a criminal before the grand jury. We have many such cases now pending before the courts. I take it that the Supreme Court of the United States and the supreme courts of the States will do a corporation no harm when doing right, and if they are in the wrong they will be punished. It is the legal and constitutional way to try these matters, and they should not be subject to mob rule.

Q. (By Mr. Farquhar.) Are the independent producers chartered corporations in your State? A. Why, the Argan is. I do not know, but I think Scofield, Schurmer & Teagle are a partnership. I do not know of a single independent one that is alive.

Q. You spoke of the remedy. I don't think it is clear to the commission exactly what you may call the gravemen of the complaint of the independent producers? A. The Standard, by means of controlling transportation, causes the producer to receive always less than the true value for his oil. This is effected by discrimination in rate tariffs. The Standard has been able to determine the price of crude oil and the rates for shipping it, and the independent producers of the State demand protection so that they can obtain equal shipping facilities, which they do not now get.

Q. What more protection can they get than the farmer who is selling 50-cent wheat in the West? Do not these independents with their oil sustain the same relation to the railroads as the farmer with his wheat? A. When the wheat shipper is at a non-competitive point on a railroad and when the company, in order to meet competitive rates at a point like Duluth, charges such a price that he can only receive 50 per cent. of the value of his product in the markets of the world, he is injured in just the same way as the oil producer by excessive charges for transportation.

Q. (By Mr. Farquhar.) And without remedy? A. He has his remedy.

Q. What is his remedy? A. The Federal court held last year that the interstate commercial rate cannot be so low that tribute must be levied upon State commerce in order to maintain traffic; or, take the converse of the proposition, you cannot make the State traffic so high and the interstate so low that the State shipper is contributing to the interstate shipper. The remedy that I suggest must be finally adopted is this: That the State and interstate rates must be so adjusted that the burdens will be equalized. Whenever you have accomplished that you have demonstrated the fundamental principle that the public highway is controlled by the public; the railway is a substitute for the highway. The public owns these highways, and there must be an honest classification of freight rates, and a fair allowance for loading and unloading, and the roads must not abuse this principle in order to grant favors to certain shippers. There can be an absolute destruction of vested interests by classification of freights and by charging exorbitant local rates. Four hundred per cent. more on a ton per mile basis is required to carry freight from Columbus, O., to Cardington, O., than from Columbus, O., to Cleveland, O.

Q. (By Mr. Ratchford.) I should like to have you revert to the subject of the proposed law in Ohio and explain the main features of it a little more fully to the commission. You were touching upon it a little way back and then went to another subject. A. You have the Ohio statute here; I can take it up briefly. We have passed an anti-trust law, and it went into effect July 1, 1898. We have quite a number of cases pending under it. There are the cases of the beer trust, the Standard Oil Company, the Buckeye Pipe Line Company, the Solar Refining Company and others.

PROPOSED LAW FOR THE REGULATION OF FREIGHT RATES IN OHIO.

Q. I have reference to the law looking to the regulation of freight rates. A. The general proposition was to amend our maximum freight rates, bring them down somewhere near the commercial competitive rate, and then make the interstate rate per ton per mile the basis or measure of the per ton per mile rate for Ohio business; in other words, to apply the long-and-short-haul clause of interstate commerce to Ohio business, and not permit discrimination against inland non-competitive towns and in favor of competing towns like Cleveland and Cincinnati. That is all there was of it. It was a per ton per mile for local business the same as a per ton per mile on through business, exactly. Just to make it perfectly clear to the commission, the bill proposed that the same tonnage rate per mile be charged for a 10 or 20-mile haul as for a 50 or 100-mile haul. It allowed a variation of 10 per cent. only for a shipment of less than 20 miles.

Q. Did the railroad companies oppose that? A. They opposed that violently.

Q. What was the position of the coal companies? A. I do not think they appeared before the commission. Mr. Rend was there on the first trust investigation; he was an unwilling witness; we caught him and subpoenaed him.

Q. Do you know whether the coal men of Ohio ever complained against this discrimination in freights? A. Yes; they have now filed complaint

in my office; I think Collins and Fahy are among them; they are now out gathering testimony on this. In order to maintain the coal trust, coal cars of the independent coal producers were side tracked. That is the complaint. I will furnish you testimony here from the gentlemen who were discriminated against. While they told us they were getting the same rate, they said they did not get the same conditions. They could not get their coal delivered in time to fulfill their contracts with customers. By such means the independent coal producers' customers were destroyed. I have given Mr. Jenks the names of the gentlemen; I think that they will testify on these points, and give you a little data, because one of them was an employe, at the time, of one of the leading railways involved in the matter.

Q. What were the principal objections raised by the shipping companies against that law? A. The most intelligent reason given was, I think, by the gentleman representing the Erie or the Lake Shore; he stated that if the freight rates were all adjusted on that basis he believed it would be exactly fair, but that certain manufactures were now built up, and certain centers prosperous on the other system, and it would demoralize and derange towns and industries, and that it would create panic in one place and flush times in another, before it would be possible to get back to the normal condition of affairs. The Pennsylvania Company has a gross income of $15,500 per mile; if it could distribute that gross income in that way it would make no difference to the company; it has to have that much—$15,500—to pay dividends on its stock and pay for repairs, taxes and employes. It makes no difference to the railroad company itself where that comes from, and they would just as lief distribute it equitably between local and through shippers, but the moment they attempt that trouble arises on account of the great competing centers like Chicago and Duluth, where the companies come in contact with the Canadian Pacific and the water ways; and they cannot undertake it, because, when they meet water, they have to make water rates.

Q. Have you any reason to believe that the producers of coal in your State were induced by any coercive means to keep their hands out of that fight? A. Well, the ways of the lobbyists are so mysterious we do not have an opportunity to find out.

Q. However, you are of the opinion they favor equalization of rates? A. I think so, yes. I think every independent producer would favor equalization of rates. We do not want Baltimore to compete with Columbus in shipping groceries to Nelsonville; we do not want the wealth of Ohio poured into New York and Chicago; we want our share of it; and would have it if we had no discriminating rates. By discriminating in transportation you can dry up the most fertile valley on the face of the earth; you can reduce all the little cities along the line of a railroad to villages, and give this wealth to the great centers, by discriminating in railroad rates alone.

Q. (By Mr. Phillips.) Are there not a number of chartered companies in Pennsylvania controlled by producers that are operating in your State, for instance, the Empire Oil Company and perhaps the Victory Oil Company? They may have been chartered in New York State; but are there not a number of chartered companies controlled by producers doing business in your State? A. As far as the oil business is concerned, my opinion is based purely upon conclusions of testimony taken; they do not practically compete in their respective territories; for instance, the Standard Oil Company of Ohio has its territory and the Pennsylvania Oil Company sells in a portion of Ohio, but practically they do not compete, because they are all one system, although they claim they are acting independently. They never wage a war between any of these different companies. I never heard of one.

WHAT WILL BE THE EFFECT OF PRESENT INDUSTRIAL DEVELOPMENT ON GOVERNMENT.

Q. (By Mr. Kennedy.) I should like to ask you if it is your opinion that the evolution which is now going on, if unchecked, will lead to a control of the industries of this country and to control of the government by a few hundred or a few thousand men? A. Well, that is mere conjecture. I feel as though we are under a republican form of government. We have as socialistic a form of government as man has ever been able to invent; and as soon as the people have an opportunity to control matters in the way I suggest—to take away charters, as well as grant charters—a condition of affairs will never rise whereby the monarchical institutions you suggest will be substituted for our republican form of government. Monarchies represent primogeniture and the principles of tying up property in a few hands. All this is what brought on our Revolution. I do not think we will drift back into these abuses, although we have made rapid strides in the last two years toward these monarchical ways. I believe it has gone about as far as it will go. Commissions like your own honorable body are getting the facts impartially; Congress and the people will know of the evil; you will diagnose the disease. There have been a good many patent medicines advertised to cure government ills, but they do not reach the disease. I think when you go through with this investigation and procure data you can give us more light on these questions. I know this from three years of experience in my office. I know, so far as the State is concerned, that it has absolute power to regulate many of the abuses you refer to, namely, the abuses of governmental powers exercised by creatures of the State.

Q. Would not the result which I suggested be realized if other industries were controlled in the way that a few men in the Standard Oil Company control the oil production of the country? A. Yes; that would be the result. The socialists are advocating that this abuse be continued, and claim that it will demonstrate the possibility of government ownership. When a few men get possession of all public utilities the socialists propose taking them

away. That is their theory. The government ought to own all public utilities, and ultimately the only way to demonstrate the possibility of such a system will be to allow a few people to demonstrate it first. Men with power like Rockefeller and others will demonstrate the feasibility of central ownership and control, and then the government can take their place.

Q. That is the point I wished your opinion on. A. If we always had men like Rockefeller to run such things it might be better for the public than government ownership.

GOVERNMENT OWNERSHIP OR CONTROL AT PRESENT WOULD BE DANGEROUS.

Q. Would it be preferrable to have the government control these public utilities or to have a few men, the representatives of the corporations, run the industries pertaining to them and run the government, too? A. The Federal government has 100,000 employes now and it almost raises a panic every time we have a presidential election, so great is the demand for spoils. I do not know what would happen if you added any more to that. It looks to me as if, under the present civil-service rules, the government ownership of any or all these utilities would create such a public disturbance that our institutions would be in danger.

LOCAL GOVERNMENT OWNERSHIP SUCCESSFUL.

We have a great many instances of public ownership in Ohio; 76 per cent. of the waterworks plants are owned by cities, and many electric light and gas plants. Local powers are granted to cities, giving them the opportunity to buy street railways; that can be followed up by rights to maintain interurban roads. The experiment has been successful, as no doubt you know, in the old country. Glasgow, Vienna and other cities owning their public utilities.

I have been converted to that theory, viz, that cities should be given the right to determine for themselves what public utilities they desire to own or control. It will furnish a check to further abuse of municipal franchises operated by private companies.

FRANCHISE TAXES IN OHIO.

Q. (By Mr. Farquhar.) I suppose you have in Ohio a law the same as the Ford franchise bill of New York, taxing that class of property? A. We are pioneers on that principle, you know. We have the Nichols law, where we take the stock valuation as the tax valuation, and not the value of physical tangible property. Other States have been following our law. Michigan has been following it, even extending it to railroads; we have not proceeded that far. We substituted the excise tax—one-half of 1 per cent. for an additional tax upon railroads. Since I have been in public office we have had a fight on that, but the law passed. We drew from the Pennsylvania Company $96,000 additional tax under the excise law; we collected $450,000 under the excise law, the one-half of 1 per cent on gross receipts. That is what New York is doing now, except that New York proposes to make it 1 per cent.

SUIT AGAINST THE BREWERY TRUST.

Q. (By Mr. Jenks.) Take up the suits against some of these other combinations, outside of the Standard Oil Company. A. Yes; we have other suits; one against the Cleveland and Sandusky Brewing Company, which is now operating a trust; some ten breweries have placed their property in a pool and paid a promoter $30,000 for mortgaging their property back to themselves, and attempting to raise the price of beer over their competitors. The trust is on the same plan as the other trusts; we have testimony that one man asked $5,000,000 for his plant, which was only worth two and a half million; they would not buy, and then undertook to destroy his business. They would not cut the prices of beer; but wherever there was a competitor with a long established business and possessing the good will of the business, they would buy him out. If the plant was worth $10,000, they bought it for fifteen or twenty thousand, if it could not be obtained for its true value; and then put their beer in the place of the independent dealer's beer. They went out and bought up his customers, and almost raised a commercial and industrial war among the saloon men in the bar-rooms of Cleveland. We commenced suit three weeks ago against this brewery trust, under the Valentine-Stewart act.

THE TRUST PROMOTER.

Q. You raised one point that you did not bring out clearly, viz, the question as to the power of the promoter. A. The Standard Oil Company trust is not run by a promoter. Other trusts will take a firm of attorneys and draw up one of these contracts and start out and get options on the leading industries that are making a profit in any one craft or business. The owners will sign options to sell their plants for a given amount to an individual, who becomes in fact a trustee. When he gets all the options he can on competing plants they then organize a corporation, usually in New Jersey, and this individual turns these plants all over to the trust, and claims it to be an absolute sale to a new company. The courts in Missouri have recently walked right through that fiction and held that trusts cannot be disguised by one corporation buying the plants for the purpose of deeding them to one man, who deeds the same to a company formed for the purpose of buying in competing plants. A promoter works it up; the new company issues bonds—first-mortgage bonds—and sells them, and the promoter pockets the profits. In this particular case he received $30,000.

Q. That is a matter of evidence? A. That is a matter of evidence. It is from a statement gathered

by attorneys preparing the testimony for our contest. It is the testimony of men who have made affidavit. It amounts to this: Ten companies are paying a man $30,000 to get them to combine their interests into one company. It is a mere myth, it is a South Sea bubble scheme; but there are always men glad to try it.

Q. In the case of the brewers' combination that you have spoken of what was the amount of stock they issued, as compared with the valuation of the plants? A. They issued preferred stock usually for about the amount of the actual value of the constituent plants.

Q. That is true in this specific case? A. Yes; and the common stock may be from three to five times that, and represents nothing except speculative value.

Q. Do you recollect how it was in this specific combination? A. No; I cannot give that. I know they issued mortgage bonds enough to pay for the actual property purchased. They have not transferred a single share of trust stock in four weeks, since the suit was filed. A great many of the interested parties are German, and they expressed a desire to settle—to have the investments put back into competing companies.

THE CRACKER TRUST.

Q. Can you mention any other combinations in Ohio that have been prominent? A. Well, we have a suit pending now against the cracker trust. Under their promise, so far as Ohio territory is concerned, they agreed not to violate any State laws. Although we have not taken testimony, we have filed interrogatories. They have a system of bonuses that they give back to the customer if he buys exclusively of them, and the only evidence we have of their violating the tacit understanding with the State is in the case of a new cracker firm which recently leased grounds and buildings in Columbus and bought machinery. When it was found they were leasing a building and buying machinery, the president of the cracker company sent for them and told them that if they undertook to go into business (that is their statement to me) the cracker company would ruin them. The reply was that contracts were out for cracker machinery and the construction of buildings, and that suits for damages would follow if proceedings stopped. Thereupon the trust agreed to take the plant off their hands whenever it was completed. Those trusts are not so dangerous, because I do not believe that when competition can enter any trust can long thrive. The New York trust could not; the whisky trust could not. Only when they get some private advantage in the transportation department do they ultimately thrive.

Q. Have you any information of still others in the State of Ohio? A. We have the tobacco trust, but we have not filed a complaint in that case as yet. The next suit filed was that against the tin plate trust, ten days ago, in Cincinnati, by the prosecuting attorney.

SUIT AGAINST THE CENTRAL PASSENGER ASSOCIATION.

Q. That is substantially all that you have direct evidence against so far? A. We have a suit pending against the Central Passenger Association.

Q. (By Mr. Phillips.) Is that the American Tin Plate Company to which you referred earlier? A. Yes. He said he had evidence now to start the suit; I do not know what the name of it is. The Central Passenger Association has grown up since the decision in the Joint Traffic Association case of the United States. We base our suit on the strength of that decision. So far as Ohio business is concerned we claim that the Ohio courts have jurisdiction over railroads over railroads in the State and can prevent them from pooling their issues through the Central Passenger Association and issuing thousand-mile tickets with rebates, holding up $30 and giving back ten after the mileage book is used up, in case it has not been transferred. It is questioning their power to pool rates for the purpose of selling thousand-mile tickets. We insisted that since that joint-traffic decision we must have competition between railroads so far as Ohio business is concerned.

Q. (By Mr. Jenks.) If I understand you, the different railroads of the State of Ohio have agreed to issue thousand-mile tickets for $30 and give a rebate of $10 when the ticket is used up. A. The Central Passenger Association is made up of different railroads. They sign the tickets individually. They have an executive committee located at Chicago; and they have by-laws and a constitution that we have had furnished us through interrogatories that were attached to their pleadings. They sell a thousand-mile ticket which connects over the different railroads that are in the combination, and then return $10 in case the ticket is not transferred. It is really a scheme to prevent scalping. It is aimed at the scalper, but is really a scalping system. The railroads themselves furnish directly to scalpers thousand-mile tickets that are good over a number of roads. This system destroys the competition that small travelers used to enjoy. The Central Passenger Association is organized to prevent competition.

Q. Are there other combinations concerning which you have information? A. That is all.

TRUST LEGISLATION.

Q. Have you further suggestions to make as to remedial legislation? A. Here is a copy of the Ohio statute. We collated different trust statutes last year very carefully when we drew this act, and based it upon the trust investigation. We find that if we had to do it over we would add that clause I spoke of in this morning's testimony, exempting any witness from testifying from incriminating himself. That has been approved by the United States Supreme Court. That clause should be added to the statute. Texas has this year added a special amendment to this act that has substantially the same features. At least, they have an act reaching directly the insurance companies; but as we had an

anti-trust insurance law in our State, we did not incorporate it here. They suggested State confiscation—merely duplicate damages—while the Sherman act made it triplicate.

Q. (By Mr. A. L. Harris.) How many States have similar laws? A. Twenty-six States have anti-trust laws, if I have the facts correctly, and this winter there have been quite a number of bills pending. I do not know what finally passed.

Q. (By Mr. Ratchford.) Have you studied the measure pending in the Michigan legislature on this subject? A. Yes.

Q. What is your judgment of it? A. They have adopted ours; we forwarded them a copy; they put in the amendments we suggested. We are not entitled to the credit of our bill. It is a composite bill of the New York, Illinois and Texas laws. We did the same last year; we took the latest acts for a guide; and they are doing the same now.

Q. (By Mr. North.) Would a law of that kind in three-fourths of the States be a sufficient remedy? A. It would correct all but the interstate features.

Q. Would not it practically compel suspension of business on the part of trusts? A. It would; yes.

Q. (By Representative Otjen.) You have indicated how the trusts might be run by the State, but supposing these corporations are organized in New Jersey, as many of them are, how would you reach them in Ohio? A. We have reached them in nearly all the States under the insurance legislation, or what is called offense against the comity of States. A State can legislate and impose conditions upon which a foreign corporation can come into it. We have, under our trust law, reached them; a foreign corporation is reached the same as a domestic corporation so far as they do business in Ohio contrary to trust laws.

Q. There would then be very little distinction between companies organized in any other State and in your own State? A. There is no distinction. States have more power and control over a foreign corporation than over a foreign individual; a corporation must do business in a foreign State upon such terms as the State authorizes.

Q. (By Representative Livingston.) Do you consider Section 11 of the Ohio law a very practical one, where it authorizes the recovery of damages to twice the amount, to protect the State? I mean to ask this question: Are a great majority of the people so situated that they can take advantage of that clause? A. No; the average man is not; the small dealer is not damaged enough to warrant him in doing so. They baffle him by wearing him out with vexatious litigation. He cannot litigate as a large rival concern might do. For instance, a poor girl in Chicago took a contract for laundry and the laundry trust there followed up her customers. She sued the combination and recovered a verdict of $5,000, which has been sustained; but litigation of that kind is expensive, and in this case the attorneys took it through. They bore the expense to get it through, so that ordinarily it is not an effective remedy. It is well to have them in cases where the damages are enough.

Q. Have you any suggestions to make to the commission concerning interstate regulation? A. No; I am not conversant with that at all; I have given my attention entirely to the State feature.

AFFIDAVIT.

State of Ohio, County of Franklin:

I swear or affirm that the statements made by me of my own knowledge in the foregoing report of my testimony before the Industrial Commission are true, and that all other statements I believe to be true. F. S. Monnett.

Sworn and subscribed before me this 20th day of September, 1899. Geo. C. Blankner,
[Seal.] Notary Public.

Washington, D. C., June 8, 1899.

TESTIMONY OF W. H. CLARK, NEWARK, OHIO.

The commission met at 2 p. m., June 8, 1899, Vice Chairman Phillips presiding. Mr. W. H. Clark testified.

Q. (By Mr. Jenks.) Will you kindly give the commission your full name and address? A. W. H. Clark, Newark, Ohio, 203 North Fifth street.

Q. Have you been engaged in selling oil for the Standard Oil Company? A. Yes.

Q. At what different places have you been engaged in this business? A. Marietta, Urbana, Springfield, Columbus and Newark.

Q. For how long a time? A. I went to work in 1893.

Q. And have been working all the time between 1893 and now? A. Solidly, up to February 7.

METHODS USED IN BREAKING UP THE BUSINESS OF COMPETITORS IN MARIETTA, OHIO.

Q. What kind of work have you been doing at these different places? What has been your experience with the Standard Oil Company, and what are their methods of doing business? A. I was first employed at Marietta, O., as office boy.

Q. At what time? A. In the fall of 1893, I think. I went there as office boy and was later promoted to warehouseman or cooper. There we had quite a time. We had the Producers' Refining Company, the Argan Refining Company, the George Rice Oil Company and the Marietta Oil Works to contend with. While there Mr. Curtis, an oil driver, a colored fellow, was buying of the Argan. We got Mr. Frank Davis to compete with him, i. e., with the Argan price; we had Mr. Davis put his oil down cheaper than the Argan Oil Company.

Q. Was Mr. Davis a dealer before? A. No; he was furnished a horse and wagon and I hired him by the week. Things went on that way for a time. After awhile Mr. Curtis got tired of his business and came to us and told us that if we would make some arrangement so that he could buy oil of the

Standard Oil Company he would. We made the arrangement and took a mortgage on Mr. Davis's wagon. We put up a bluff, foreclosed the mortgage and let him go.

Q. As soon as Mr. Curtis came to terms with you, did you stop the business of Mr. Davis? A. Yes, and the price went up.

Q. Can you tell us about the price at which you sold, while Mr. Curtis was selling the oil of the competing companies, and then what the price was afterwards? A. The oil was 7 cents while Mr. Davis was selling, and when he quit oil went up to 12 cents.

Q. And further? A. After Mr. Curtis bought of us a little while he went back to the Argan again. I forget the name of the man who managed the Argan, but he went back again. Mr. B. A. Mathews, Columbus, O., sent down Mr. Ebright under a salary, and we played the farmer racket. We went out and got a big cart and barrel with a faucet in it, and went around selling cheap oil.

Q. Who was Mr. Mathews? A. He was manager of the Standard Oil Company stations of the Ohio Southwestern.

Q. And was Mr. Ebright a man that had been sent down by him to do this work for you against Mr. Curtis? A. Yes.

Q. About how long did Mr. Curtis keep up competition, the first time, before he yielded? A. I think it was about three or four months.

Q. What was the result of the competition, the second time, by Mr. Ebright? A. Why, we cut the price again and Mr. Curtis had to come back to the Standard Oil Company again. After I left Marietta I went to Springfield, O., and took a country tank wagon. While at Marietta we sold our oil all over the surrounding country. We had probably 15 or 20 towns; we sold up the Muskingum as far as Beverly, up the Ohio as far as Newport, and down the Ohio as far as Frost, on the B. & O. Railway. We had two storage tanks, besides our gasoline, and we sold eight grades of oil.

DIFFERENT GRADES OF OIL SOLD OUT OF THE SAME TANK.

Q. Two storage tanks from which you sold eight grades of oil? A. Yes; we had eight different prices. We sold O. S. T., i. e., Ohio State Test, the Prime White, the Water White—

Q. Can you give us the prices of these different grades? A. I cannot remember them now; there was about one-half cent difference. We had to change the prices to suit the customer. We had the Red Star, the Water White, the Crystal Light, the Eocene, the Hyperion and the Silver Light, while at Marietta.

Q. Do you say the difference of price between these different grades was about one-half cent on an average? A. Yes; we would begin about 6 cents a gallon and run as high as 10½ cents.

Q. If you were selling a man this oil at 10½ cents and he thought that price too high, did you agree to sell him a lower grade at 9 or 9½ cents, and furnish it out of the same tank? A. Yes; and furnish it out of the same tank under a different name.

Q. Was that generally by the orders of the Standard Oil Company? A. Yes.

PUTTING GASOLINE IN TURPENTINE.

Q. What men, for example, gave you the order to do that? A. Mr. Hollingsworth and Mr. Mathews. They said that people did not know what they wanted, and that we should give them what we thought they needed. If a man came in there and wanted to buy a good oil for 10 cents we gave the best oil we had, of course, and charged him 10 or 10½ cents. We sold turpentine at Marietta to W. H. Styer and Siler Brothers, druggists there. We would often get a barrel of turpentine and to increase the profit we would put three or four gallons of gasoline in the turpentine. Gasoline is worth 7 cents and turpentine 38 or 40 cents. We poured the gasoline right in the hole of the barrel.

Q. Was that also under instructions from the Standard Oil Company? A. Yes; the boss was there, and said he would teach us a trick in turpentine, and he taught us.

Q. Have you anything further concerning the price of oil while you were in Marietta? A. I think of nothing in particular.

Q. (By Mr. Phillips.) Do you mean to tell the commission that you sold the same quality of oil from the same tank under different names and at different prices? A. Yes.

Q. The oil was of the same quality and yet different in price? A. Yes.

Q. (By Mr. Jenks.) After leaving Marietta, where did you go? A. To Springfield.

Q. And what position did you hold there? A. I was country tank-wagon man.

METHODS AND PRICES AT SPRINGFIELD, OHIO.

Q. Can you tell us something of your experience there? A. When I went to Springfield I had 21 towns outside of that place, and after awhile the trade became so heavy I could not hold it. I could not take enough oil to satisfy the trade. Finally, Mr. Mathews and Mr. T. L. Cragin, his brother-in-law, came over there. They shipped in another wagon from the Milburn Wagon Company, Toledo, O., and Mr. Foley, the agent at Springfield, went out and hired George Blazer to go to work. Mr. Blazer came down, and on the first trip went to Cedarville. While down there he found the prices were mixed up; he did not know what to do, and I think brought most of it back. Mr. Cragin was there and told Foley to explain to him about how to sell the different grades out of the same tank, by turning the faucet one way for one kind and a different way for another. Foley did not want to tell him, and said; "You tell him yourself." Finally, between the two, they told Mr. Blazer how it was.

Q. Did you overhear this yourself? A. Yes; and Mr. Blazer said: "If I cannot work for an honest

company I will quit." He quit that day. This was George Blazer, Springfield, O.; he lives near the East street shops.

Q. Is that something you know from having heard it yourself? A. Yes.

Q. Go on from there? A. While at Springfield I sold George H. Bell, at Cedarville, Water White at 6 cents and Silver Light at 6½ cents. I have often sold as many as four grades, the same as the rest of them, but out of the same tank at four different prices.

Q. Were the prices uniform to different customers? A. No.

REBATES: ANYTHING TO HOLD TRADE.

Q. Not even when the grade was named the same. A. No; we gave them the same and made a ticket out for the same; but we rebated them.

Q. That is, you would rebate to some customers and not to others? A. Not to the others.

Q. Did you have any principle with reference to these distinctions; or, if anyone objected, did you just simply provide for him? A. We always had to do something for a kicker. Anything to hold the trade; that was what we were there for; to keep other companies out.

Q. Was there much competition there? A. We had the Charles Ludlow Oil Company and a Cleveland company, but I do not remember the name.

Q. Did you at any time cut prices below cost against some of these other companies? A. Why, we would cut in case we had to; we would sell as low as 4 cents, and still charge other customers 7 cents.

Q. You said that, in order to drive the Argan out of business, you sold to Mr. Curtis at Marietta cheaper than they could furnish oil to him. A. Yes.

Q. Were you doing the same thing here? A Yes. Our instructions were: Get the trade, regardless of prices.

Q. Had you much opposition in Springfield. A. Yes.

Q. Do you know who were the independent companies selling there? A. There was only one in Springfield, the Charles Ludlow Oil Company; but afterwards it was consolidated with the Standard Oil Company.

Q. Can you tell anything else of your experience on the tank wagons?

Q. (By Mr. Kennedy, interrupting.) How long were you engaged in that work, selling several different grades of oil out of the same tank? A. About seven years.

Q. Did you feel that you were engaged in dishonest work while doing that? A. I spoke to them about it; they said it was not for me to say what to do, but to do what was said. That is the reply they gave me.

Q. Did the Standard Oil Company pay you well, while in their employ? A. Not very well.

Q. (By Mr. Jenks.) What wages did you get in these different positions? A. When in Springfield I got $35 a month, but went to work in the morning at 4 o'clock, and many a night worked until 9, 10 or 11, before getting in. I had one trip through Lawrenceville, North Hampton, Tremont, Terre Haute and Bowlesville.

Q. (By Mr. Kennedy.) Did you leave the employ of the Standard Oil Company because you could not engage in this dishonest practice?

MANY GRADES OF OIL ONLY NOMINAL.

Q. (By Mr. Farquhar, interrupting.) You speak of selling different grades of oil out of one tank. How do you construe the word grades? Is it a title or a condition? A. It is a brand on the barrel.

Q. And that is all it was? A. Yes.

Q. So you men were selling different names instead of different grades, with only one grade in the tank? A. Yes. We called it a grade, but still it was only a name.

Q. (By Mr. Phillips.) There are different grades of oil sold, are there not? A. Yes; the Standard Oil Company, I believe, makes three grades altogether.

Q. (By Mr. Jenks.) There are three grades of refined oil. You have not known any more? A. No.

Q. And how many different grades do they pretend to have which they sell at different prices? I think you named eight. A. Yes; I have seen a dozen grades sold at different stations.

Q. And you think they sell at as many as a dozen prices at different stations from these three actual grades? A. Well, there was just about one-half to one-fourth cent's difference in the price sometimes; Silver Light was always one-half cent more than Water White; Red Star was one-fourth cent more than Water White; but they all came out of the same tank.

Q. Would they sometimes be selling under as many as a dozen different names at one station? A. They sold under eight names at each station; but when we got to Columbus and Urbana we dropped Hyperion and the southern names, and put in the new names. There were about eight grades at each station.

Q. Out of three real grades they sold about eight nominal grades on an average? A. Yes.

Q. (By Mr. Phillips.) What are the three grades that the Standard Oil Company makes, to which you refer? Can you name them? A. I think the correct names are Diamond White, Water White, and Eocene.

THE TEST OF DIFFERENT GRADES.

Q. Can you tell what the test of these different oils is? A. The Diamond White is 150 degrees open cup and 120 closed cup. The State test is 120 degrees, and 120 degrees is what we test it ourselves. There is about ten degrees difference in each one. Of course, the cheaper the oil the lower the test; the better the oil the harder it is to ignite.

Q. How did you happen to leave your position at Springfield, O.? A. Mr. Mathews came there

and raised my salary and sent me as cashier to Columbus, O.

Q. What salary did you then get? A. I was getting $35; he raised me to $40 and sent me to Columbus.

COMPOUNDING OILS AT COLUMBUS, OHIO.

Q. What was your business at Columbus, cashier at the works? A. While I was there I had charge of the works and all the shipments. I took care of all the money, received orders, and sent out bills. We did considerable mixing in Columbus. When a person wanted a barrel of boiled linseed oil and we had none, we had an agitator heated up to 125 degrees and put in three gallons of Japan dryer; that made boiled linseed oil. When a person wanted miners' oil we would get three barrels of cottonseed oil and mix it with two barrels of miners' stock and make miners' oil out of it.

Q. Then in this Columbus establishment, instead of selling merely refined petroleum, you also sold other kinds of oil? A. That was the habit over all that district; the oil was shipped from there; all paraffin oil came from Cleveland in blank heads. If a person wanted rubbing oil for furniture, ozone, paraffin, diamond paraffin, golden machinery, or a good straight machinery, we got it in blank heads; turned out whatever they wanted and charged prices accordingly.

Q. In connection with the sale of these different kinds of oil, do you mean to say you regularly manufactured linseed oil there or sometimes had the genuine boiled linseed oil? A. No; we never had any of that.

Q. (By Mr. Phillips.) Was the genuine linseed oil worth more per gallon than that which you manufactured? A. In boiling and handling the oil a certain per cent. is lost. We took a low oil with a little Japan dryer, but the dryer being thicker than the linseed oil, does not mix, so we put it in a range that held five barrels and heated it up to 125 degrees, when the dryer would come to the top and we would mix it; that would make it a dark color and it would go off for linseed oil all right.

Q. Was it as valuable as boiled linseed oil? A. No.

Q. (By Mr. Jenks.) How much money was saved by this mixing process, do you suppose? A. Anywhere from 5 to 6 cents per gallon.

Q. Besides boiled linseed oil, what others did you make in this same way? A. To make miners' lamp oil we took three barrels of cottonseed oil and two barrels of miners' stock and mixed them.

Q. Was that for the purpose of saving on the cost? A. Certainly; paraffin was worth 10 cents, extra golden machine 12 or 13 cents, and light rubbing oil was worth 14 cents. We just branded the oil to suit the customers, and gave them what they wanted.

Q. And gave substantially the same thing? A. The same thing in every barrel.

Q. (By Mr. Ratchford.) I should like to get the process of compounding the miners' oil. Do you say it was three barrels of linseed oil and two of other oil? A. Three barrels of cottonseed oil and two of miners' stock.

Q. What did the oil generally sell for after the mixing took place? A. Miners' oil varies. Sometimes it is as low as 22 cents and goes up to 34 cents. The miners' stock, I think, costs about 6 or 6¼ cents; the price of the cottonseed oil depends, of course, on the market; the American Cottonseed Oil Company, of Cincinnati, regulates the market.

Q. What do you understand by miners' tar? Do you handle any paraffin wax? A. We handle it only in pound cakes and 20-pound slabs, but we do not use it for that purpose at all—it would not do.

Q. (By Mr. Jenks.) In the position you held at Columbus as cashier you know, of course, about the details of the business, i. e., how this mixing was done; but did you yourself take part in it? A. No; but every day I would have to go out in the warehouse and make a report for the time. Mr. Adam Paulus would come to me and say he wanted to mix up some miners' stock and would like a number of barrels; I would deduct them from my stock report each day, so that the report showed what we sold and what we had left in stock; it showed every empty barrel left at the station at night.

Q. To whom did you make your report? A. I made it to the general office in the Wheeler building. A boy would come down and get it every day.

Q. Did I understand you to say that the mixer did that work as his regular business? A. No; he mixed oils, but when he did not have that work to do he would take care of the machinery.

Q. Was it your business to furnish the different kinds of material he wanted? A. He would order so many barrels and I would see that he got them. These barrels were dumped into the kettle and he sat there and stirred it up. I would stay there to see that he dumped it in. I would charge him up with so much oil, and give him credit for the empty barrels he had taken.

Q. After this oil had been mixed did it come into your hands again, being the different oils of the stock you had to sell? A. Yes.

Q. (By Mr. Farquhar.) Have you had any experience outside of your work for the Standard Oil Company in compounding oils? A. No.

Q. Do you know any of the other formulas of the compounders of oil in the United States? A. Well, I have been around refineries, but I never noticed that they compounded at all.

Q. Are you aware there is such a business in refineries? A. In my talk with other people I find they never compound as we did.

Q. But you don't know anything about compounding outside of what you saw in the works of the Standard Oil Company? A. I do not.

METHODS OF MEETING COMPETITION AT COLUMBUS.

Q. (By Mr. Jenks.) Have you anything further to say with reference to your experience as cashier in Columbus? A. We had our secret process there as at other places. We had our rebates at Colum-

bus, which made oil about one cent a gallon cheaper, on account of the Cleveland Refining Company being there as a competitor. When they came there it was pretty hard work for the Standard Oil Company, so they hired Mr. E. W. Shoemaker to start the Shoemaker Oil Company. Mr. Shoemaker came up and the Standard Oil Company had painted on Charlie Carr's wagon in big letters, "Shoemaker Oil Company." We often got orders, the same as Down & Milliken, at Washington Court House, for carloads of oil; they had to buy cheaper, so the Standard cut the old prices at Washington Court House; that is, they cut prices and sent it to Shoemaker at reduced prices, and branded it Shoemaker Oil Company.

Q. That is, it was supposed they had bought from the rival of the Standard Oil Company when they were buying from the Shoemaker Oil Company? A. Yes.

Q. (By Mr. Phillips.) And was that used by the Standard Oil Company to supply both? A. Yes; Mr. Mathews said that he stood their share of the loss, and if there was any loss the Standard Oil Company stood it on these cut prices. Mr. Shoemaker drew a straight salary and loaded his wagon at the Standard's warehouse. Mr. Clarence Tolan, who was his bookkeeper and cashier at the Shoemaker Oil Company, boarded with me at Mrs. Dickson's, on North High street. He was bookkeeper and cashier at the Shoemaker Oil Company and I was cashier and bookkeeper down at the Standard Oil Company's works. We were together all the time, boarded together, and went together.

Q. Were both of you receiving pay from the Standard Oil Company? A. Yes.

Q. Did you say that Shoemaker was paid a salary? A. Yes.

Q. Do you know that for a fact? A. Mr. Mathews swore to it as a fact before Mr. Monnett, in Columbus.

Q. (By Mr. Phillips.) About what was the magnitude of the business while you were cashier there? What would your footings show each day in the month? A. Well, lots of days it ran up to $700 or $800. I have known one wagon, that of Mose Gradwohl, to take in $200 in one day.

Q. Have you anything further with reference to the work at Columbus? A. I do not think of anything more.

Q. (By Mr. Phillips.) Do you know about how much the competitors of the Standard Oil Company sold in Columbus? A. Clarence Trimble told me that we were about on an even basis. Mr. B. A. Mathews hired a boy to go and see how much oil they were shipping out each morning. We would go down to the station every day and watch the tank cars which they got, and watch their business, too.

Q. (By Mr. Jenks.) Did he report to you every day? A. He would take account of the tank cars and give us the number and we would send the report to Columbus.

Q. (By Mr. Phillips.) Were the competitors driven out of business in Columbus while you were there? A. Well, they cut prices so that those people came and arranged with the Standard to hold prices up to a certain point. Prices remained the same excepting what few rebates we had.

Q. Do you not know how much they were permitted to sell? A. No, I do not.

Q. Or what proportion of the trade they obtained under that arrangement? A. No, I do not. They had an arrangement; they went from one to the other; if the Standard Oil Company telephoned down there to raise prices, they would raise them.

Q. (By Mr. Kennedy.) Did the other companies in Columbus also sell many different grades of oil from the same tank? A. They never handled but three grades that I knew of.

Q. Three? A. Yes. They handled Penoline, Safety Light, and Electric Light.

Q. Do you mean they had one grade of oil in a tank and sold three different grades out of it? A. No; they had three storage tanks; we had 10 at Columbus; we had our cottonseed, linseed, turpentine, and two water tanks; we had 10 tanks, and they had, I think, four; one held 5,000 barrels and one held 10,000 barrels; and we had another one that held 1,000 barrels.

Q. Do you know of their having deceived the public in the same way the Standard Oil Company did? A. Not that I know of.

AGENT'S SPECIAL COMPETITION REPORT.

Q. (By Mr. Jenks.) Were you in a position to find out? Were you in a position where you would have been likely to find out if they were deceiving the public the same way as the other people did? A. We always made it a point to go around and see what they got; that was always our instructions, just the same as though it was our business. I probably have got some of the Columbus letters with me now. I have one here dated May 28, 1896 (reading): "W. H. Clark, Urbana, Ohio. Dear Sir: Herewith inclosed please find competition list to be filled out by you the 1st of June. Please fill out carefully and return, and add to this list any parties you know of who are buying all or portions of their goods outside. Yours very truly, B. A. Mathews."

Here is another letter dated July 3, 1896 (reading): "W. H. Clark, Esq., Urbana, Ohio. Dear Sir: Inclosed please find competition sheet to be filled out very carefully and returned to me as soon as possible after you receive it. Please give full information with reference to parties on list, and where names do not appear of parties who are buying outside, please enter them, giving full information. Yours very truly, B. A. Mathews."

Q. Have you a copy of the competition sheet with you? A. I think I have one; the competition got a little fast on us, and this was sent to me: "May 25, 1897. W. H. Clark, Newark, Ohio. Dear Sir: I forward to you today a supply of blanks same as sample herewith inclosed, which is to take the place of the little slip that has formerly been used for reporting daily competitive oil. Will you kindly fill out one of these blanks weekly, commencing June 1,

and whenever the month ends in the middle of the week, make out one on the last day of the month for the portion of the week not covered in the last week you report. Enter upon this report all competitive oil or gasoline that you have been able to locate during the week, and if during the week you have been unable to locate any competitive shipments, then write across the face of the blank 'Nothing to report' and mail it to this office. Be sure to mail it whether you have competitive receipts to report or not. If there is anything about this report that you do not understand, please confer with me at once, as it is very important that it should be made out promptly and forwarded regularly. Trusting that I will have your hearty co-operation, I am, yours very truly, B. A. Mathews." I have not one of these blanks.

Q. Have you not one of those competitive lists? A. I have not, but I can get one.

Q. Were you ordered to fill up the competition blank regularly or not? A. Yes; we filled them out; first on the blank was the producer, then the name of the town, and the price he bought at.

Q. How did you find that out?

Q. (By Mr. Phillips.) From whom he bought? A. We would get around him and talk to him to see if we could get out of him what he paid for the oil.

Q. (By Mr. Jenks.) You spoke of having a boy for that? A. Yes; it was his business to notice every tank car that came in for the competitors.

Q. Was that boy paid regularly by you to do that work? A. He was regularly paid for that work.

Q. By you? A. Yes; he drew $15 a month; his name was Clarence Trimble.

Q. (By Mr. Phillips.) After sending in these reports, what instructions did you get about meeting this competition? A. Well, in some cases we were not ordered to do anything, but the next time we had any business transactions we were to attempt to get their trade; and even if it cost us a dollar or two we were to try to get hold of it.

Q. (By Mr. Jenks.) You say if it cost you a dollar or two. Do you mean that you were to cut prices that much? A. Sometimes we would buy empty barrels, but we would cut that much sometimes. If we had to pay more than market prices for them, we would say that we would take them in at so much apiece. I do not mean barrels of oil, but empty barrels.

Q. That is, if they would take your oil instead of that of your competitors you would take the barrels at an exorbitant price? A. Take them all; yes.

Q. Do you recollect any other methods you employed in order to crush competition? A. There is nothing that I think of at Columbus.

Q. (By Mr. Phillips.) Do you know of any other instances of selling under assumed names excepting the ones you mentioned at Columbus? A. Only at Columbus.

Q. (By Mr. Jenks.) How long were you at Columbus? A. I went the 20th of March and staid until the 16th of December.

STANDARD OIL COMPANY'S METHODS AT URBANA, OHIO.

Q. Then what change did you make? A. Then I was promoted to be manager of the Standard Oil Company at Urbana, Ohio.

Q. You say you were promoted. What increase of salary did you get? A. They did not increase my salary at first, but paid my board until March; then they raised me $15 a month.

Q. That is, you had had $35, then $40 and board, and then you were raised to $55? A. Yes.

Q. Will you tell us with reference to your experience at Urbana? As manager you really had full charge of all their business? A. Full charge; yes.

Q. Did you receive instructions directly from Mr. Mathews? A. I received instructions directly from Mr. Mathews; and when any business around there had to be seen to I was the one to look after it. Everything fell to me; but things ran along smoothly. I had no competition. Charlie Ludlow did not come out. He bothered us once in a while, but we did not pay any attention to him. Finally Mr. William Helmick, who had formerly been in the oil business there under his father, Mr. John Helmick, but who, after his father died and left him some money, bought a farm and went to farming, came there. When he saw he could not do anything farming he sold his farm and invested his money in the oil business for the Cleveland Refining Company.

Q. Do you know how large an investment he made? A. I do not know the amount. I know the first shipment he got in was 300 and some dollars, and I remember he told me his bill. Finally Mr. H. S. Hollingsworth, of Columbus, came over. He takes care of a good deal of the business for Mr. Mathews at present as well as then. He came over then, and he and I went out to Mr. Helmick's house and tried to scare him out of it. We told him we were going to cut prices and everything, and Mr. Helmick was kind of nervous. Finally Mr. Welsh, of Springfield, came up.

Q. Was Mr. Welsh another employe of the Standard Oil Company? A. Yes; he was a cooper man, and worked at the cooper shop in Springfield. All three of us talked with Mr. Helmick about oil, and about selling us the oil at the price he paid for it. He refused to do that at first. Finally we worked a bluff on him about cutting the price, and did cut it a little in one or two places where he was selling. He had to dispose of his oil the best way he could.

Q. In these places where you cut did you cut below what he had been paying for the oil? A. Yes.

Q. Then I suppose you threatened to cut still further? A. Yes; to cut still further if he stayed in the business.

Q. How much did you say you would cut? A. I think oil was selling at wholesale in Urbana for 8 cents, and I believe we cut to 6 cents, or about that. I know it went down about 1½ to 2 cents.

Q. And you made threats to cut it still further? A. Yes.

Q. How far? A. We told him we would go 1

cent a gallon further. Finally he quit the business and went to the poorhouse. His sister from Iowa came and took him out, and he is out there now.

Q. (By Mr. Phillips.) Was that caused by the purchase of $300 worth of oil? A. He had most of the trade; he was a citizen there and the people liked him. He could have handled the trade there and made an honest living. When he came he put up a building. We would not take the building off his hands, and would not help him out any at all. We just closed in on him like any other person; and when you close in on them pretty hard, you know what happens.

Q. (By Mr. Kennedy.) Did you not say you started up there and had no competition until he came? A. Yes; we had no competition to speak of until he came in.

Q. (By Mr. Jenks.) And when he came, he put up this building and began buying oil, and you agreed, if he would quit, to take his oil off his hands? A. We were willing to agree to do that, but he would not do that. We worked a bluff on him. His wife was on the stair steps in the hall and stayed there and cried. We had quite a time when we were there.

Q. You did not, then, take any oil off his hands? A. I think we got about four or five barrels. We just painted those over and shipped them out in the name of the Standard Oil Company.

Q. But he must have disposed of the oil he had at some price? A. He disposed of it all over town; wherever he could drop five barrels he dropped it.

Q. He must have sold his building for something? A. No; he did not get anything out of his building. The council of Urbana does not allow over one barrel of oil or gasoline at any one place; more than that must be 200 feet from any building. He had to build his building away out of town, so that it was no good to him.

Q. So you think that, owing to your competition and threats, he practically lost all his money? A. He lost it all.

Q. (By Mr. Kennedy.) In other words, you think the Standard Oil Company drove that man to the poorhouse? A. I think that is what caused it.

Q. (By Mr. Farquhar.) Had this man had any experience in buying oil before that? A. His father had been buying oil for 20 years of the Standard Oil Company, and had their tanks there. He was in the business probably 20 years.

Q. Did this son have experience? A. He worked for his father all the time and drove his wagon.

Q. Did they come in opposition to the Standard Oil Company? A. They came there and the Standard Oil Company bought them out. Finally the old man died, leaving his money to his son, who then started up.

Q. But he did not know his business? A. He knew the oil business.

Q. (By Mr. Kennedy.) Did you not say this man had failed as a farmer just previous to his going into the oil business? A. Well, his wife did not like the farm. He did not make much money, and was not doing much on the farm. His wife did not like it and was in town all the time. He could not stand it, and so he sold his farm.

Q. (By Mr. Phillips.) And put the money into the oil business? A. And put it into the oil business.

Q. You spoke of his going to the poorhouse. How did he come to go to the poorhouse? On account of failing in health, or from not getting any employment? A. You see, Urbana is a kind of a little town; it has two strawboards there, and Barley, Kent & Co.

Q. (By Mr. Jenks.) What is their business? A. They make furniture. There is not much work, so he did not get anything to do. That is all he could do.

Q. Was the man strong, so that he might have worked? A. He could have worked. I do not suppose he was stout enough to do hard manual labor, but he could do work, like driving around and waiting on the trade.

Q. Probably he could not go into this furniture establishment, or any place like that, to get regular work? A. No; it was too heavy for him.

Q. Have you anything further with reference to your experience as manager in Urbana? A. No; I stayed there until fall, then I went to Newark, Ohio.

Q. (By Mr. Phillips.) How much did the Standard Oil Company's trade amount to, in Urbana, a month? A. We would run by the month, I suppose, about 40,000 or 50,000 gallons; our line went as far as Mechanicsburg on the east, West Liberty on the north, Tremont on the south and St. Paris on the west, making quite a scope.

Q. (By Mr. Kennedy.) Did you also sell several grades of oil out of the same tank in Urbana? A. Yes.

Q. (By Mr. Jenks.) Were the general methods there the same as at other places? A. Yes.

MANY DIFFERENT PRICES FOR OIL AT NEWARK, OHIO.

Q. Then you went from there to Newark? A. Yes.

Q. Was that in the nature of a promotion also? A. They promised me a raise when I went to Newark; they changed my salary to $2.25 per day; that made more money than what I was getting on account of the days.

Q. So you did get an increase in salary there? A. Yes.

Q. What position did you take at Newark? A. I was manager at Newark.

Q. Was your business the same generally as it was in Urbana? A. Yes; but Newark was a larger station than Urbana.

Q. How much more business did you have to oversee there? A. Our Newark business ran about 80,000 gallons per month.

Q. Can you tell us with reference to your experience there? A. At Newark the business was much harder than it was at Urbana on account of the fact that we had from 20 to 25 prices. We sold J. P. Lamb & Co. gasoline at 7 cents; Mr. J. M. Brown, in the store beside them, we charged 9½ cents. We charged Mr. Rankin 6 cents for oil, and drove right down to Showman Brothers and charged them 7½

cents. We then drove to Mr. Hagmeier and made him a ticket out the same as the others, but we always rebated him. I think I have his receipt here now. Here is one.

Q. Will you read it? A. (Reading): "February 28, '99. Mr. Clark, when agent of Standard Oil Co., has paid me a great many rebates on goods which were receipted for when given. Geo. J. Hagmeier."

Q. About how much of a rebate did you make, Mr. Hagmeier? A. One cent on gasoline and 2 cents on oil that he picked up.

Q. When you were selling to others at 7 cents you billed his at 7 with a rebate, so you really sold him at 5? A. Yes.

Q. Did you make that to Mr. Hagmeier on direct instructions from the office? A. Mr. Mathews himself was in the office in November; he told us in Newark; he told me to give it to him.

PRICES FIXED BY THE MANAGER AND NOT THE AGENT.

Q. How much discretion did you have with reference to making rebates and making special prices? You, of course, were under general orders, as you have just said, to get the trade and keep the trade? A. Yes.

Q. Were you at liberty without instructions from Mr. Mathews to make a rebate of 2 cents a gallon wherever you thought it was necessary? A. No; I would write him that some customer, or somebody, was buying outside oil, and then we would either come over or send Mr. Hollingsworth, his secretary. They would tell me to go any make the arrangement—authorize me to go and make the arrangement.

Q. You did not have authority to make any special price yourself without direct instructions in each separate case? A. No; I could not change the price to anyone; I had to sell at the price they told me. If any customer was buying outside oil, I would write them to come over, and they would come over or tell me to make the arrangement.

Q. So all of this change in prices was always under special instructions for each particular case? A. Yes; I always wrote those letters to Mr. Mathews personally; I did not write them to the office.

Q. Were your letters to Mr. Mathews always marked "personal?" A. I would write to Mr. Mathews personally.

Q. That is, you did not dare to write to anybody but Mr. Mathews? A. I would write to Mr. Mathews personally, i. e., put his name on the letters so that nobody but him would open them.

Q. (By Mr. Farquhar.) Were those changes in rebates or prices made by your suggestion to Mr. Mathews? A. If I lost a customer, if a customer went to buying outside, I would write to Mr. Mathews about it, and he would come over, or write to me to make that customer a certain price.

Q. Then it was your representation to Mr. Mathews that caused the change in price? A. No; he always told me to go and make the price.

Q. How did you know what price to make if you did not write him? A. I did not know what price to make and he would come there and tell me what to do; sometimes he would say: "Cut half a cent, or 1 cent, or 2 cents." I just reported to him on a slip of paper. I met the competition if the customer was buying somebody else's oil.

Q. (By Mr. Jenks.) It was on your report that Mr. Mathews made these cuts? A. I sent in a report every week just like the one I read; he read those slips and wrote me a letter and asked if I could not get those people in line. Then, if the name went in a couple of times and I told him I could not get them in line, he would come over and authorize a cut.

Q. (By Mr. Phillips.) He did not authorize you to make the cut? A. No; I could not cut at all.

Q. (By Mr. Farquhar.) In other words, in your business as canvasser for trade, you could easily find a customer at a certain price or a certain rebate, and you suggested that to Mr. Mathews and then the cut was made? A. No; I could not do that.

Q. I did not say you could. That is the reason you misconceived my question; I want to find out if a suggestion was made to Mr. Mathews. Would they have to be buying the outside oil A. As long as it was one of our customers buying our oil, I could not make any suggestion to him because I never paid any attention at all; but if any person bought outside oil and I would report any outside oil, then he would go looking it up.

Q. In getting new customers, and in getting customers certain rates, how else could you? How could Mr. Mathews know anything at all about it without you informed him? A. I sent him in a report every week.

Q. Yes; certainly. So that all these cuts and suggestions, there, were on the part of the Standard Oil Company? A. Yes; Mr. Mathews made them himself.

Q. Did you have any positive orders from the Standard to make the cuts—any suggestions? A. No; I reported each week the customers that were buying outside oil, and he would wait about one week and write a special order to do the best I could. If I could not do anything, I would go ahead the next week and say: "I am not selling any oil." Then he would come over there himself and say: "You make them a cut of a cent a gallon and see if you cannot get them to come in again." He might say half a cent or 2 cents, and whatever he says goes; I could not change the price; I could not guarantee a man any price.

Q. As the agent of the Standard Oil Company you were just as anxious to get a customer as the Standard Oil Company was? A. Certainly; I had nothing to do with the price.

Q. (By Mr. Jenks.) The only discretion you had was with reference to the fact that you could give the name of the oil you sold him; and if he asked for a high grade, you would sell him a higher grade out of the same barrel and for the same price? A. Occasionally, if a man wanted a little better oil, or something, I could brand it Silver White, or Red Star, and give it to him out of the same tank.

Q. Did he get it at the price that had been fixed for that brand? A. I would tell him I would give him some of this oil and a little better price on it, and he would not know. It was just the same as Capitol Cylinder and other oils we sold there in Newark. We charged the Newark Ice and Cold Storage 32 cents for Capitol Cylinder, and went up to the Newark waterworks and charged them 31 cents. Those prices were made by Currier, a special man.

Q. Was Currier a special agent of the Standard Oil Company? A. Yes.

Q. Also in the office at Columbus? A. Yes.

Q. A man who came up to give you those instructions? A. Yes; he came around and made those prices; that is, I did not have anything to do with it. He would come around and cut the prices where he thought it was necessary.

Q. And you just delivered the oil? A. I just delivered the oil; and I would deliver it to them at the price he sold it to them for a year. If he sold it to them at a certain price and gave them a contract for another price for a year, I would look to see what the price was and charge them that price.

PROCEEDINGS AGAINST THE AGENT OF SCOFIELD, SCHURMER & TEAGLE, OF CLEVELAND.

Q. Did anything come up at Newark besides driving these competitors out? A. Nothing except that Mr. Al. Donaldson started there for Scofield, Schurmer & Teagle, of Cleveland. After he had been in business awhile and seemed to be doing pretty well, I went down and bought his building while he was away. I had a man, Mr. Retburg, break a lock off, and we went in and threw his tanks and barrels out and loaded the building, the whole thing, on a dray, and hauled it off. When he came back he had no warehouse.

Q. Had he leased this building. A. Yes.

Q. (By Mr. Phillips.) Had his lease expired? A. No; the lease was on yet, but I had the man sign a contract that no oil should go on that lot.

Q. Would he not have recourse on this man for the oil and the damage done him? A. He just got scared and sold us his wagon, all the oil he had, the desk in his office, and everything. We got the whole shooting match.

Q. Who fixed the price? You say you went down there and bought it. Did you have the discretion to fix the price, or was it done under orders from Columbus? A. I suppose the man wanted $5; Mr. Mathews did not say just what he wanted to pay. He wanted to know what price I could buy it for. Finally Mr. Hollingsworth said if I would get him out he would give me two weeks' vacation on salary.

Q. So that you had discretion to get rid of a rival? A. It cost $2.50 and the Standard Oil Company paid for the building.

Q. Did Scofield, Schurmer & Teagle establish a new office? A. No; they dropped it. His writing desk is now in the Standard Oil Company's office in Newark.

Q. How much did you say you paid for the building? A. I paid $2.50. It was just a shed warehouse. It was a poor thing, but it was worth more than that.

Q. (By Mr. Kennedy.) Did you ever in any of these cities sell oil to any customers below the usual rate except for the purpose of driving out competitors? A. No.

Q. Did you ever bestow favors on any individuals? A. No.

Q. (By Mr. Jenks.) What inducement did you give the owner of this shed to sell it for $2.50? One would not suppose that that was enough to induce a man to enter into any such business as that? A. Well, I got to talking around him, and kept around him.

Q. Was he a special friend of yours? A. Yes; we had a lot of repairing of oil tanks. The wholesale storage tanks got to leaking and I gave him all the work. The Standard Oil Company always paid for the work, and I gave him what work I could and helped him out.

Q. So that he did not merely get this consideration of $2.50 for his shed, but also, practically, a promise of work from time to time? He was also a good friend of yours and he did it for friendship's sake more than anything else? A. Yes; for friendship; but it was not what the building was worth; the building was worth a dozen times that.

Q. (By Mr. Phillips.) Did he know you were going to take possession of this building the way you did, when he was out of the city? A. Who, Donaldson? No; he did not know anything about it until he came back and found everything gone. Besides, he had Mr. Charles Sessor working for him. He stayed in the office and Mr. Sessor drove the wagon around town. Finally, Mr. Hollingsworth and I made arrangements to hire Mr. Sessor at $10 a week, and put him around right on Al's trade. Mr. Sessor had worked for him, and knew his trade and where to go to. We told him that if he could not get the regular price at any time to take what he could get, and keep the cans full all around while he could.

Q. (By Mr. Jenks.) What pay did he get before? He got 75 cents a day to follow the oil wagon on a bicycle. Then I hired Roy Jones at 75 cents to follow Al around and see where he stopped. Then the next day, Mr. E. G. Mathews, our canvassing agent, would go to those houses and explain to them how good the oil was and clean their lamps and fill them up, and have them send our wagon around there to let them try this oil at the reduced price.

Q. Did you have any instructions to pay this boy 75 cents per day to go around and follow up competitors? A. Yes; and I had to bring the boy around to Mr. Hollingsworth, who had a talk with him before we hired him.

Q. Who went with you to take this building when you bought it? A. I went down the street and got a crowd of fellows and brought them up.

Q. What did you pay them? A. A dollar, I think, for the whole bunch.

Q. Cash or drinks? A. Both, I think; I gave them a dollar and went with them.

Q. Did you get your vacation? A. I have not got it yet; yes, I guess I have got it now.

Q. They said you were to get two weeks' vacation if you got rid of the competitor. Why did you not get your vacation; you got rid of him? A. They said I was too busy. The man at Washington Court House rode out on his bicycle and got hit by a train. We had to send Mr .Milliken down there until they could order a man from Zanesville. I did not have any extra men.

Q. They did not express positive approval? A. I have a letter here from Mr. Mathews complimenting me on the way I got rid of him. This is a special punishment they award, that they have for their friends.

Q. (By Mr. Kennedy.) I suggest that the witness state the substance of the letter, if he cannot find it.

Q. (By Mr. Jenks.) If you cannot find it, will you state what the letter said? A. (Quoting): "I wish to compliment you on the way you got him out of business." It was a very short letter—just a little short piece on the top of it.

Q. If you can hand me the letter afterwards, will you do so? A. Yes; it came to me typewritten afterwards; it was just a short quotation.

Q. Now, in reference to this business in Newark? A. He complimented me on pipe fitting. I did some pipe fitting under Mr. Paulis's supervision. I got the compliments both at once. I was surprised.

Q. Have you any further instances in mind of driving out rivals or any other special methods employed at Newark? A. No; we never used any methods except our cut.

Q. Except what? A. Except having different prices for different people. We used that more in Newark than anything else.

Q. Do you recall how many grades of oil you were selling there—that is, nominal grades? A. Three; that was all. We had three storage tanks, one 14,000-gallon tank, one 18,000 and one 4,500.

Q. You did not pretend to have more than four grades of oil? A. No, we had one gasoline and three grades of oil.

Q. I understood you to say a little while ago that in most places where you were selling oil you had as many as eight different grades? A. We had three grades; that was all we had. We sold Diamond White, Prime White, O. S. T., Water White, Crystal Light, Silver Light, Eocene; and when we had a man who wanted oil from Cleveland we painted the barrels red and branded them, I believe. I know they sent us a stencil from Cleveland.

Q. They sent you a stencil from the Cleveland office? A. And it was marked Standard Oil Company, Cleveland, and we had those barrels painted red. I forget what name we put on for him.

Q. And you filled those barrels out of the same tanks and put the Cleveland brand on and sold it with that brand? A. Oh, yes; each of those brands. Some had the same brands and some different brands.

Q. (By Mr. Phillips.) Did you sell the same brands at Newark as at the other places? A. We dropped the Hyperion at Newark and put the Diamond White on the cheap list.

Q. (By Mr. Jenks.) Will you tell us again with reference to the amount of trade you had at Newark as compared with the amount at Urbana? A. We had about a third more, I suppose. At Urbana they ran about 50,000 and at Newark it was 80,000.

Q. (By Mr. Phillips.) That is, 80,000 gallons per month? A. Eighty thousand gallons.

Q. (By Mr. Jenks.) When you left Newark where did you go? A. I went back to Urbana.

Q. Was the change in the nature of a promotion this time? A. No; Mr. Hurst, who had been agent at Newark, wanted his place back, and Mr. Mathews gave it to him.

Q. He had been manager there before, and you took his place? A. I took his place. He went away somewhere, but he returned and wanted his place back. I got my place back at Urbana.

Q. You went back as manager at Urbana? A. Yes; I went back as manager at Urbana.

Q. Were your wages cut down? A. No; they remained the same.

Q. As you had at Newark? A. Yes.

Q. Was there anything different in carrying on the business at Urbana the second time? Did you have any new experience? A. No; not during the time I was there. I went back and staid six weeks.

Q. Only six weeks that time? A. Only six weeks, and everything went along quiet.

Q. Then where did you go? A. I went back to Newark again.

Q. To what position? A. Manager of the Standard Oil Company.

Q. Had Mr. Hurst left again? A. He went on the mail force, carrying mail.

Q. Working for the United States government? A. Yes.

Q. Were your wages the same the second time at Newark? A. Yes, but they paid board for me for six weeks when I came back.

Q. So there was a little increase for a time? A. Yes.

Q. How long did you stay this last time at Newark? A. About two years.

Q. And up until last February? A. Yes.

COMPANY'S METHODS ADOPTED BY OWNERS OF TANK WAGONS AT NEWARK.

Q. Did anything new happen during your last residence at Newark with reference to the methods of business? Are there any special instances that you have in mind? A. Nothing, except that the tank wagons occasionally made a little kick, and we would give a little reduction and then cut it off again.

Q. Explain a little more in detail what you mean by that. A. When one of the customers would

kick, we would cut the price to him half a cent a gallon; in fact, we cut the price to all the wagons a cent a gallon. We sold them gasoline cheaper than we sold the stores. Oil sold at the same price.

Q. The tank wagons were not owned by the Standard Oil Company; you sold a little directly to the wagons? A. We simply sold to them.

Q. And they would retail it out? A. And get what they could for it.

Q. These tank wagons had how many grades? A. They had three spaces.

Q. They would have that many grades of oil? A. No; they had two spaces for oil and one for gasoline.

Q. Do you know whether they were in the habit of giving different names in the same way you had done when you ran the oil wagons? A. My man there, Mr. King, was, you might say, the head of these fellows. More of them paid attention to whatever he said than to anyone else. He was an employe of the Standard Oil Company for a year and a half or two years. Through him they got to selling any kind a person wanted. If you wanted 15-cent oil you could get it; if you wanted 10-cent oil you could get it.

Q. They adopted the methods they learned from the company? A. Yes.

Q. I suppose that is a method anyone might develop for himself? A. Mr. King said that if he could work it for other people he could work it for himself.

HOW WITNESS CAME TO LEAVE EMPLOY OF STANDARD OIL COMPANY.

Q. Will you tell us how you came to leave the employ of the Standard Oil Company? A. Well, I came in one evening when Mr. E. C. Lockwood was there.

Q .Who is Mr. E. C. Lockwood? A. He is a kind of general man from Cleveland.

Q. Standard Oil Company manager? A. Yes. He goes around and inspects the stations and property; he looks over everything about a station and makes a report on its condition, whether the yard is clean, etc.

Q. Special inspector. Is that about it? A. Yes.

Q. Sent about? A. He has three States that he travels over.

Q. Is this blank from which you have here on which he makes his report, so far as you know, the general one he sends from each station? A. Yes; that is the one sent from each station.

Q. Will you offer this in evidence here? A. I will leave you the copy. We had one taken every two or three months at that station. When he came there to make the inspection, I came in at night and had worked a little hard and was tired, and I suppose cross. Anyhow, he came in there all dressed up, and I was not in a very good humor. He began to tell me how to do things; how to do this and that thing in the yard.

Q. How to do what? A. He wanted to tell me how to blue barrels, count staves ,weigh oil, and all that sort of thing. I had done that for seven years and I did not think he could tell me.

Q. Did you know who he was? A. I did not know at all that he held a position, so I told him he could not. He said I might lose my position by it, and I told him I did not care about that. I gave him a good jawing and never thought all the time that he was a person connected with the oil company. I did not know who he was. In consequence I got a lay-off. I never got a discharge, and I never have gone back.

Q. How was that done? By Mr. Mathews? A. Yes.

Q. Have you a letter? A. I have the letter in my pocket.

Q. Will you be kind enough to read it?

Q. (By Mr. Phillips.) Give the date of it, please? A. (Reading inspection report.)

EXHIBIT A.—INSPECTION REPORT.

Date, October 3, 1896.

Station ——, Newark, Ohio.

No. 1: Is date received written or stamped on each empty barrel? Old stock of Hurst's on hand not dated.

No. 2: Are shipping tags, also date, left on until barrel is used; and if no shipping tag, is shipper's address written on barrel? See above.

No. 3: Are oldest barrels worked up first? Demand has been such that all new and most of old stock has been used.

No. 4: Are all cripples worked up currently? Same cripples on hand as when Hurst left. Mr. Clark states that he has worked up cripples coming in while he has been here.

No 5: Are light machine barrels steamed out as soon as received? Yes.

No. 6: Are barrels bunged properly?

No. 7: Are barrels properly filled?

No. 8: Are all bung staves removed when weak at the bung-holes?

None filled or prepared by hand account yesterday. Busy shipping day and all barrels used.

No. 9: Are barrels painted good color? Paint dull account, I think, of paint, as Hurst had some trouble.

No. 10: Are barrels neatly stenciled? None prepared. See above.

No. 11: Are barrels properly glued? None prepared. See above.

No. 12: Are tank wagon or warehouse buckets and gauges on filling tanks correct? Verified by Mr. Cragin and Mr. Henderson.

No. 13: Are same buckets or measures on tank wagons or at warehouse used for both oil and gasoline? No.

No. 14: Are tank-wagon faucets in a leaky condition? No.

No. 15: Are the tank wagon and dray kept clean? Were as clean as weather past week would permit.

No. 16: Are the horses properly cared for? Had not been curried this a. m. Stables not cleaned.

No. 17: A. What is their average feed? 6 to 8 9 to oats. B. Cost of oats, 32 cents; corn, 35 cents; hay, $9. C. Cost of new shoes, $1; resetting, 50 cents. D. Have you been able to get any better prices on hay, feed, or shoeing? Price is 60 cents better on shoeing. E. What check is there that full quantity of feed purchased is received? City weight; Hurst has been paying $1.50.

No. 18: Any leaky valves around plant? No.

No. 19: Any leaky joints or pipe around plant? No.

No. 20: Any leaky tanks around plant? No.

No. 21: Is glue trough and kettle and vicinity kept clean? Yes.

No. 22: Is sawdust on hand to dry up any oil that might leak or spill on the floor? Yes.

No. 23: Is ground kept dry around tank car unloading place? Grounds were wet, due to a leaking connection on a car being unloaded. Had Mr. Clark throw dry dirt on ground and place a bucket under tank.

No. 24: Is ground kept dry around tank-wagon loading place? Yes.

No. 25: Are shovels kept over all sand barrels? Yes.

No. 26: Are grates and doors properly locked up when agent is absent? Yes.

No. 27: Is pump room in good condition? Yes.

No. 28: Are pumps well packed and in good clean condition? Yes.

No. 29: Any unfilled orders on hand that should have gone out? No.

No. 30: Any deliveries on previous days that have not been reported? No.

No. 31: Does tank wagon, dray or any of the buildings or tanks need painting or repairs? No.

No. 32: Is the warehouse, office and yard kept in orderly and clean condition? Warehouse much cleaner than kept by Hurst. Yard and office clean.

No. 33: What time did the agent get around in the morning? 6 a. m.

No. 34: How much time does he take for dinner? 30 minutes.

No. 35: What time does he leave at night? 5:30 to 9 p. m.

No. 36: Are they keeping sample or each tank car received properly labeled and kept in the dark three months before dumping? Samples on hand not labeled. Instructed Mr. Clark that they should be.

No. 37: Is oil inspected before tank car is dumped? Yes.

No. 38: Is there any old lubricating oil or specialties on hand. If so, give us memo. showing filled dates on barrels. See inventory, a decrease over last inventory. Mr. Clark has sent out some of the old boarders.

No. 39 Any barrels not properly gauged? Test at least ten barrels and give agent's gauge and correct gauge of each None prepared or gauged. Account yesterday being shipping day.

No. 40: What prices paying for coal? $1.25, grade nut. Have you been able to get any better figures? Not on quantities purchased.

No. 41: How many barrels of each grade prepared? None. How many filled of each grade? None.

No. 42: Are weeds cut down in yard? Yes.

No. 43: Is agent sending in competition report? Yes.

GENERAL REMARKS.

Make a careful and personal inventory of all stock and material on hand and return attached to this report. See inventory.

H. S. Hollingsworth.

It is just a check, you know. I will leave that.

Q. We will put it in the testimony, then, and make it a part of the record, so you need not read it all over. A. When he came there to make the check we got on the outs. I would not help him at all, and I kind o' threw things in his way. Every time I could I would do it, either the oil or the barrels or anything, so that he could not inspect it. Finally I got a letter from Mr. Mathews at Columbus.

EXHIBIT 2.

February 4, 1899.

W. H. Clark, Esq., Newark, Ohio.

Dear Sir: Owing to the difficulty in getting matters checked up at the Newark station, we have decided to discontinue your services for the present. Immediately upon receipt of this please turn over all papers, keys and everything belonging to the company to the bearer, Mr. W. W. Hughes, who will take full charge of the station for the present.

I do not wish you to consider this as a discharge, for the reason that if everything is in proper condition after we have thoroughly checked up the station there will be no difficulty whatever in having you reinstated.

Yours, very truly, B. A. Mathews.

So I am not discharged at all.

Q. How long was this after you had had the inspector there? A. I think it came in about two or three days, just long enough for him to write after I had told him what I thought. He said he could not check up the account of the barrels while I was there.

Q. Have you had any further suggestions from the Standard Oil Company that you might be taken back into their employ again? A. They have been talking around. My brother-in-law worked for them at the same time I did. He had charge of the office there, and they were down there to see him the other day and wanted to know what I would work for them for.

Q. Who was that? A. Fouts.

Q. Who is he? A. I think, Mr. Mathews's man.

Q. A man who works with Mr. Mathews? A. Yes.

Q. He wanted to know what you would work

for? A. I told him I would work for $500 a day, with six months' pay in advance, and that I would work one day and quit.

Q. What is your objection to working for them now? A. If the report which you send in every month should contain an error of $2, they just take it out of your pay. They never send for you, but just take it out of your pay. It might be a mistake of a clerk on some bill, or something, or an error in figuring up the accounts of the tank wagons.

Q. If any mistake is made by one of their agents they simply deduct? A. Or any of them, of the men under me, if any one of them makes a mistake, it all comes out of my wages.

Q. Will you put one or two of these reports and letters in evidence here? A. Yes. So you see it don't help me so much after all. If there was any mistake made by any of the men they always took it out of me.

TESTIMONY AGAINST STANDARD OIL COMPANY IN OHIO.

Q. (By Mr. Kennedy.) Did you recently give testimony in Ohio against the Standard Oil Company, showing up its operations so far as you know them? A. Yes.

Q. That occurred after you left the employ of the company? A. After I had been laid off.

Q. When was that? A. I do not know. It was not very long after that. I do not remember the exact date at all. It was not very long afterwards.

Q. You told it freely there just as you tell it here, did you? A. I could not tell anything else. They asked me the questions ,and what could I tell them?

Q. What I would like to know is this: If you had continued in the employ of the Standard Oil Company would you have been apt to give the same kind of testimony? A. Not in the humor I was toward them just then.

Q. Would this commission be apt to get testimony similar to this of yours from managers of the Standard Oil Company in other parts of Ohio? A. Ask any person there, and if they would come out and tell you the truth they would tell you just the same as I do.

Q. Would Mr. Mathews have testified the same?

Q. (By Mr. Jenks.) Mr. Mathews, for example, would he give similar testimony? A. Mr. Mathews did not know anything when they had him on the stand before Mr. Monnett. I saw by the papers that he did not know anything.

Q. Would you not have been apt to have been in the same position, if they had asked you, provided you had not been discharged by the Standard Oil Company? A. Well, if I was a Sunday school teacher like him, I do not think I would have said that I did not know, if I did know.

METHODS OF STANDARD OIL COMPANY'S COMPETITORS.

Q. (By Mr. Farquhar.) While you were agent for the Standard Oil Company, in those various towns, did any opposition company ever sell below your rate to get a foundation? A. Why, no; Mr. Ludlow and those gentlemen sold at a cent higher than we did. We always kept below. We were the low people.

Q. Did you regard it as in the line of competition when another company was selling at a cent or a cent and a half a gallon more? Did you call that opposition? A. They always sold higher. They could not furnish it as cheap as the Standard Oil Company. The Standard Oil Company always sells cheaper than other people can make the oil, and ship it cheaper into the town.

Q. (By Mr. Phillips.) Do they get lower freights?

Q. (By Mr. Jenks.) Better freight facilities? A. Freight as well. I have a letter here with reference to freights.

Q. (By Mr. Farquhar.) You speak of opposition companies coming in. I want to know whether these opposition companies sold at the same rate as the Standard Oil Company, or above or below? A. Well, it would vary; sometimes they would sell at the same price, sometimes it would be a quarter of a cent higher, and sometimes a quarter of a cent lower, but the average was always higher than the Standard Oil.

Q. What amount of earnings could they get today if they had to get customers to pay more to an independent company than they would to the Standard Oil? A. Lots of them said they had no love for the Standard Oil Company; they treated them all too bad.

Q. In selling oil from the tank or from the store is there any friendship in it at all? Is it not a simple commercial transaction of buying a good oil for a low price? A. I talked to lots and lots of them. Lots of stores feel that they would be willing to pay more for the other oil than they would for the Standard Oil.

Q. Is there enough of that class of buyers to make a difference in buying and selling oil so that an opposition company can make a living and fight? Do you think any company can sustain itself on that kind of sentiment? A. The most of those people have been handling Pennsylvania oil. Of course that makes a difference, while our oil at Urbana and at Columbus came from Lima, from the Solar Refining Company, and had the sulphur in it.

Q. (By Mr. Jenks.) Do you think the oil of your rivals was better than your own? A. Yes; it was Pennsylvania oil.

Q. (By Mr. Farquhar.) Does the high standard of the oil explain the difference in price? For instance, was Scofield's oil of a higher standard than yours A. No; Scofield's was not.

Q. Whose was? A. Charles Ludlow's and the Independent, of Mansfield.

Q. How could you take away their customers if you had a lower standard of oil? A. Why, we would give it to them so cheap that they really had to take it. If they did not buy it, we would get wagons on the street and sell it so cheap that they could not stand the competition.

PENNSYLVANIA OIL COMPARED WITH OHIO OIL.

Q. (By Mr. Phillips.) Is it not a fact that the Pennsylvania oil, the crude oil, is worth considerably more than the Ohio? A. The Pennsylvania oil will run 30 cents a barrel more than the North Lima. What is the North Lima worth?

Q. I do not know. Is not North Lima worth 78 today?

Q. I do not remember the last quotation? A. Is not Pennsylvania about 105?

Q. 113. A. I know it always runs that way. We heard the North Lima got down to 52 cents a barrel during the summer.

Q. Is it not a fact that it is very difficult to deodorize the Ohio oil? Is it not mixed with sulphur and arsenic and very difficult to get a good illuminating oil out of it? A. Yes; the only thing is to get the sulphur out of it. There is a German who has invented a way of brushing the sulphur out with some kind of a brush, and has patented the arrangement: but, of course, it is awfully expensive. The Standard has bought the patent. It is just like churning milk; it will take the sulphur out, but it makes it awfully expensive to handle.

Q. Do you think any customer will buy what is called Lima oil and Pennsylvania oil at the same price? Will he not prefer the Pennsylvania oil to what is denominated Lima oil? A. Pennsylvania oil would be the best oil; there is more life to it; the Pennsylvania oil is what we get the paraffine out of, while the Ohio oil has sulphur.

Q. (By Mr. Farquhar.) From your experience, will you explain how many customers out of ten would buy the cheapest oil? A. If they knew it, the whole bunch of them would buy it.

Q. It is your own experience as a seller of that oil that the object of the general run of the customers is to get the cheapest and save a cent or half a cent? A. I have seen customers that would not buy it if you sold it to them two cents cheaper.

METHODS OF MAKING LAMP TESTS OF OIL.

Q. I mean the general run of customers. Do customers generally think as much about the quality as the price? A. Oh, yes; they do. We oftentimes make a lamp test just the same as Mr. Mathew's man. If a man kicks on that Ohio oil and has got the Pennsylvania, we go in and make a lamp test. We turn our Ohio oil low and his Pennsylvania oil high. If we turn the Ohio oil high it would give out more smell of sulphur, but we don't do that. It is just a little trick of ours in turning up the wick. We can fool any person on their oil that does not know. You can take any person and beat them on their oil.

Q. (By Mr. Jenks.) Were you regularly instructed by Mr. Mathews to make your tests in such a way as to beat your customers A. Yes, we have two lamps for such purposes at each station.

Q. (By Representative Livingston.) How were your orders given to you to do that—to make those tests? A. He told us verbally, came and explained it to us.

Q. You got no letters; nothing in writing at all? A. He never told us anything in writing; he always came and told us just how to do it.

Q. Can not you find something in writing on that line in some way or other? A. I do not know; I may have comething.

Q. Do you think if you put a man on the stand here that he will not contradict you? A. They can not do it and tell the truth.

Q. Do you know they will do so, and prosecute you for fraud? A. Let them do it.

Q. Have you no way of substantiating what you have said? A. I will tell you this, that the Standard Oil Company does a lot of things that they do not let go down on paper in writing. Lots of times they will make a trip that will cost them $2 or $3 before they will write a letter.

Q. You are sure you have nothing in writing?

Q. (By Mr. Phillips.) Ask him if he cannot support this by other testimony?

Q. (By Representative Livingston.) I want to know if you cannot do it over their signatures? A.. I have not anything here, I have no letters on that subject at all; I did not think about that.

Q. (By Mr. Phillips.) Are there any other persons that have this knowledge that would be willing to testify to these facts? A. D. J. Hull, at Urbana, has seen it tested often. W. Hughes, of Newark; H. S. Hollingsworth and E. G. Mathews, of Columbus; W. O. Reed, of Marietta. In fact, any of the agents; any of the high men.

Q. (By Mr. Jenks.) Are those men all in the employ of the Standard Oil Company now? A. Yes.

Q. Do you know anyone who is not in the employ of the Standard Oil Company who has had the same experience you have as to instructions for testing oil? A. I do not know of any, except those that worked around with me.

Q. Do you not think of anybody who is not in the employ of the Standard Oil Company? A. No; they are all head men and they are all holding their places.

BUSINESS WITH THE RAILROADS.

Q. (By Mr. Kennedy.) Have you handled lubricating oils? A. Yes.

Q. Do you know anything about the furnishing of railroads with lubricating oil and the prices charged them? A. We furnished the railroads lots of refined oil, but I do not know the prices charged. We always made out their bills, so many gallons, and then sent the bill to Columbus, and they put the price on it.

Q. Do you know anything about the price of lubricating oil? A. No; the agents never know any thing about it, except the head men at Columbus.

Q. (By Mr. Jenks.) What railroads did you sell oil to in this way? A. The Baltimore and Ohio Railroad Company.

Q. That is the only railroad company you ever sold oil to? A. Yes.

Q. And you never knew what price they paid? A. We billed it to the Baltimore and Ohio Railroad Company, Baltimore, Md.

Q. Where did you deliver the oil to them? A. To the roundhouse at Newark.

Q. (By Mr. Phillips.) About how much per month did you deliver to the Baltimore and Ohio Railroad? A. In the summer time about 60 to 80 barrels a month; and in the winter as high as 150.

Q. What quality of oil was this? A. It was Water White.

Q. Did you sell them lubricating oil? A. No; it was refined.

Q. Where did they buy their lubricating oil? A. They bought it of the Atlantic Refining Company of Pittsburg.

Q. Is that also the Standard Oil Company? A I do not know; I don't think it is; I will not say about that.

Q. You simply sold them refined oil? A. We simply sold them refined oil, but I do not know about the Atlantic Refining Company. I remember their traveling men used to come to Newark to see us. I always used to bring them up to the station. They talked there so that I do not know; but that is one reason why I thought so. I am not positive.

Q. (By Representative Bell.) I want to ask about the rebates. Did you not speak a little while ago about having some rebates from the railroads? A. I said I was not allowed to pay freight to the railroads, or have anything to do with that—with the handling of the cars—at all, myself. Here is a letter sent to Mr. Mathews.

EXHIBIT 3.

Urbana, Ohio, 2, 21, 1896.

Standard Oil Company,
Columbus, Ohio:

Dear Sir—I wish you would write the New York, Pennsylvania and Ohio Railroad in regard to the way they handle our U T L cars. I have done my best to get rid of them properly as I never hold a car 24 hours. I ordered them to switch out an empty yesterday and it is not done yet and will not probably be switched out till tomorrow. Please write.

Yours, very truly,
W. H. CLARK.

Indorsed as follows:

W. H. C.:

That is all right. Our people have some sort of an arrangement with the Erie people in regard to tank cars by which they take care of the cars.

Yours, etc.,
2, 24. B. A. M.

Q. (By Representative Bell.) You do not know anything about their freight arrangements with the railroads? A. No; I do not know anything about that. They said they had a private arrangement.

Q. That is the letter you referred to a little while ago? A. Yes.

Q. (By Mr .Jenks.) Is this last part in pencil, signed by Mr. Mathews himself? A. Yes.

Q. (By Mr. Kennedy.) Is that the way they do business? Do they send them a letter and they send you back the original indorsed in that way? A. Yes; they do that lots of times, and lots of times write across the end of a letter.

Q. They take the letter and turn it over this way [indicating] and write across the corner some little note—their business, anything they want to have delivered? A. And send it back to me; some little short note; it is nothing; never kept in the file.

Q. (By Mr. Phillips.) Do you know anything about the pipe line system of Ohio, whether there have been any opposition pipe lines handling crude oil? A. I do not know. The pipe line runs from where we used to live by Beverly to Lowell; from Lowell it runs on down and follows the river to Marietta and on to Parkersburg. I knew their line when I boarded there with Mrs. Jordan. Charles Jordan was the agent of the Louisville and Ohio on the west side.

Q. Have you no knowledge of the pipe lines, of the Standard's competition along that line? A. Not much; I know they would use oil out of a certain place and pump it into the Buckeye pipe line. A certain well is pumping so much, or the Argan refinery, or some refinery has ordered so much crude oil. He would tell me; I did not hear it: he would just tell me what they said.

Q. (By Mr. Phillips.) Has any member of the commission any other question to ask the witness?

WAGES PAID BY THE STANDARD OIL COMPANY.

Q. (By Mr. Kennedy.) I would like to ask him again in regard to his compensation. Do you say that you did not consider your compensation liberal or fair? A. I worked for $15 a month and paid $12 a month board for six months; then I got raised to $25, and then went to Springfield for $35, and got my breakfast and supper and slept there and got my dinner wherever I was. I had to work from 4 or 5 in the morning until 9 or 10 or 11 o'clock at night. Would you think that was good wages or not?

Q. When you got $15 a month, was not that as a boy—you were a boy? A. I was 19 years old and went into the warehouse and painted barrels and did all the work there was to do there.

Q. Will you state what the wages of the Standard Oil Company are as compared with the wages of other refineries in Ohio? Are they about the same? A. It is pretty hard to tell about these fellows—the head fellows; they get pretty big money, but the fellows I used to pay at the Standard Oil Company's station and the warehouse never got any more money than they could get any place else.

Q. Do you mean the Standard Oil Company people? A. Yes.

Q. How about the employes of the independent companies? Did you not know something about their wages? A. I do not know anything; I do not know what they pay; I never paid any attention to that; I never asked them at all.

Q. (By Mr. Phillips.) About what wages did you pay to persons under you? A. When I worked in Newark and Urbana, I think I got men for 75 cents a day; I think that is what I paid them. I worked Lee P. Adair, at Beverly, in the yard there for 60 cents a day; I got Fred Augenstein for 60 cents a day and then for 75.

Q. What did you say was the nature of their employment? A. They drove hoops on barrels, took care

of the team, drove the dray, or anything there was for them to do.

Q. Is that about the same wages as other people pay for similar kind of work in those places? A. No; the boys could have got more money in other places, but they wanted to work up.

Q. Did they expect to be promoted by working for Standard Oil Company more cheaply than they would for some other person? A. When they hired them they talked to them and promised to promote them as fast as possible. Lee Adair worked four or five months and got a raise of 15 cents a day; then he worked there over a year and did not get any more money out of it, and quit. I got a boy from Lowell, Fred Augenstein, who worked for a year and did not get any more wages, and quit.

Q. What were the hours that these men worked per day? A. They got to work about 5 o'clock and worked until dark. Lots of times in the summer, when the gasoline trade was heavy, we had to work every day until after dark. I have seen some days when we could get it out at 2 o'clock, but generally we would have to work late to get it out.

Q. You would average 10 or 12 hours a day? A. would average 12 all the time.

Q. (By Mr. Kennedy.) Was your promotion pretty rapid? A. I was there six years and I got $2.50. I do not know whether you would consider that rapid or not.

Q. (By Mr. Farquhar.) Did the men that you have spoken of have steady employment? A. Yes; they worked steadily; steady work for the company all the the while.

Q. All seasons? A. Yes; they worked pretty steady the year round.

Q. (By Mr. Phillips.) Has any member of the commission any further questions to ask the witness?

Q. (By Mr. Kennedy.) Will you suggest the names of any men in Ohio doing work similar to that which you did who might be brought before the commission to corroborate your testimony? A. I do not know of any of them who can not do it; they would all tell you just the same; they can not tell you anything different.

Q. (By Mr. Phillips.) Who, for instance? You named quite a number. A. W. W. Hughes, I named; H. A. Day, Newark, Ohio.

Q. (By Mr. Jenks.) What is his position? A. He has a tank wagon branch at Newark. James King, Newark, Ohio, Standard Oil Company, is the man that used to paint the red barrels.

Q. (By Representative Livingston.) Have they numbers to their private residences? You cannot reach them that way. A. Newark is only a small town and you can reach them in that way. W. H. Donaldson, Newark, and Frank Hurst.

Q. Who is Mr. King? A. He is the man who used to work for the Standard Oil Company and used to paint the barrels; he was agent for seven years of the Standard Oil Company.

Q. (By Mr. Ratchford.) You have made a very full statement as to the discriminating policy of the Standard Oil Company, both in the matter of cutting prices and in the matter of selling goods under false names, and also in the matter of unequal prices for the same goods to customers. Do you believe from the consumer's standpoint that this policy is beneficial or not; is it advantageous or not. A. We did not sell to the consumer.

UNEQUAL PRICES TO THE CONSUMER.

Q. You did not sell to the consumer? A. We wholesaled; we sold to the trade; we did not sell to the houses or any individual.

Q. Not to private houses; you delivered to the stores? A. Yes; we delivered it to the stores.

Q. (By Mr. Phillips.) Did you deliver it to the stores yourself?

Q. (By Representative Livingston.) Did that enable the consumer to buy oil cheaper?

DEALERS' PRICES UNIFORM.

Q. (By Mr. Ratchford.) If it reached the retailer by inequality of price, did it necessarily reach the consumer in the same way? A. No; most of the stores sell at the same price.

Q. Even though they buy at different prices? A. You see there is often stores that buy different grades and sell at the same price.

Q. Then oftentimes the same articles sell to the consumer for a like price? A. No; I said grades. Some stores will buy cheap oil and charge a high price, and some will buy the best oil at a high price and sell at the same price they do.

Q. Did I understand you to say a little while ago that you sold and parceled it out to consumers from the tank wagons cheaper? Yes; we sold them gasoline one cent cheaper than we sold the stores, under a contract until the 31st day of December. We gave them a contract for last year.

EFFECT OF STANDARD OIL COMPANY'S METHODS ON CONSUMERS.

Q. Acording to your testimony, then, has not the Standard Oil Company been discriminating in prices very largely?

Q. (By Representative Bell.) Cutting the opposition?

Q. (By Mr. Ratchford.) Do you believe that is an advantage to the consumer or a disadvantage? A. They generally made it up even when we were selling oil at 7 cents. We would have a fight, and after the fight we would get it higher than we had it before.

Q. That is not answering the question.

Q. (By Representative Livingston.) I do not think he understood it. A. Of course it is a benefit to the consumer right then. That was certainly true when they took it to the house at 6 cents where the stores had to pay 7. That was a benefit to the consumer.

Q. Yes? A. When we retailed it around to the houses at 6 cents they had to pay 7.

Q. (By Representative Livingston.) When they drove their competitors out of the market, was it

any better for the consumer? A. No; it went back to the old price.

Q. (By Mr. Farquhar.) Did they go back to the old price? A. They always said when crude advanced half a cent or a cent, raise oil a cent.

Q. Was it more usual to go back to the old price than to increase? A. Well, I suppose it would be more likely from time to time to go back to the old price; but after they had that fight at Newark, and sold at 6 cents, oil went up to 13 and 14 cents on the street. During that fight some people sold as low as 4 cents.

Q. Who did? A. J. P. Lamb. It was all over the windows and grocery wagons around town, "Water White Oil, 4 cents."

PRICES AT COMPETITIVE AND NONCOMPETITIVE POINTS.

Q. (By Mr. Jenks.) Do the regular prices in towns where there is no competition range higher than in towns where there is competition? A. Last summer we had no competition in Newark, and gasoline retailed, or wholesaled, for 7½ cents. In Columbus they had competition, and gasoline sold for 5½ cents; there was 2 cents difference between Columbus and Newark.

Q. Can you give any other instances of the same character? A. No two stations have the same price. All stations have different prices.

Q. Generally speaking? A. If I would quit working at Marietta and go to Zanesville, they would have different prices at that place.

Q. (By Mr. Phillips.) What has made that difference—competition? A. They always said it was the freight rate; that it cost more to handle it. It always seemed to me that where there was no competition they were charging different prices. At Newark last summer oil was a cent a gallon higher than at Columbus and gasoline about two cents higher; but at Marietta it was two cents cheaper than it was at Newark. That was before they had the trouble at Newark. Newark is generally one cent higher on oil and two cents higher on gasoline. My folks live at Marietta, and it was two cents cheaper than it was at Newark.

Q. (By Mr. Phillips.) Has any member of the commission further questions to ask the witness? Have you any brief statement to make that has not been covered by the questions that have already been asked you?

Q. (By Representative Livingston.) Do you know of any conduct of this company similar to that which you have related, but which is more public in character? A. Sir?

Q. Do you know of something of a more public character of which these people have been guilty concerning discriminations such as you have mentioned? A. I can think of nothing.

Q. That can be supported by evidence of other parties? A. I do not know of any at present.

Q. Did you ever see a lawsuit in a court house? A. I was never in a court house, except once when I took a deed in.

Q. Did you ever hear them testify? A. No; that was the only time I was ever in a court house.

Q. What court was that? A. Oh, there was no court going on; I just took a deed up to the court house.

Q. Has the Standard Oil Company been prosecuted by any body that you know of, in any cases either in a justice's court or a circuit court? A. I do not know; I am not posted on that. I was in Urbana when they were fighting there before the council. We were just in before the council, but never had any suit, or anything.

Q. You do not know of any court records that you could find? A. No.

Q. Has there not been any litigation concerning this question of methods you have been talking about? A. I do not know. If you have the papers of Mr. Monnett, they mention everything I have said here.

Q. (By Mr. Ratchford.) We have that case. A. Those papers include everything I have said.

Testimony closed.

AFFIDAVIT.

State of Ohio, County of Licking, ss.:

I swear that the statements made by me of my own knowledge in the foregoing report of my testimony before the Industrial Commission are true, and that all other statements I believe to be true.

W. H. CLARK.

Sworn and subscribed before me this 15th day of September, 1899.

[Seal.] PHIL. B. SMYTHE,
Notary Public.

Washington, D. C., June 9, 1899.

TESTIMONY OF HON. THEODORE F. DAVIS OF MARIETTA, OHIO.

The commission met at 10.50 a. m., June 9, 1899, Vice Chairman Phillips presiding. Hon. Theodore F. Davis, of Marietta, Ohio, testified.

Q. (By Mr. Jenks.) Will you be kind enough to state your full name and address to the commission? A. Theodore F. Davis, Marietta, Ohio.

LOCATION AND NATURE OF BUSINESS OF WITNESS.

Q. How long have you been engaged in the oil business? A. I have had producing interests in the vicinity of Marietta for twenty-odd years.

Q. And as a refiner how much experience have you had? A. I have had a large interest in a small refining plant at Marietta for about six or seven years.

Q. Is your refinery running at the present time? A. It is not.

Q. Will you tell us, in the first place, with reference to your experience as a producer; where the oil fields are that you have an interest in, and what your experience has been in disposing of your oil? A. I first became interested in what is known as the

Macksburg field, about twenty-five miles from Marietta, as a producer; and upon the basis of that production we established a refining plant, hoping to transport, manufacture, and market our own product. We continued the business for about two years, but were finally compelled to give it up. It was not a success.

WHY THE REFINING BUSINESS FAILED.

Q. In what way did the failure come about? A. We were not able to market our product at a margin sufficient to pay us for handling. We were confined to one grade of oil that was better calculated for particular markets which we were not able to reach. We were not able to compound any other grades.

Q. Will you explain in detail about that? A. The product of some oil fields will make good lubricating oils, that are profitable; you can market them; they are rich in paraffin. Paraffin oil is largely used for lubricants this particular grade of oil was more rich in that product, and therefore the trade was confined largely to railroads; they were the large consumers, but we were unable to reach them, because of their connections; that is, we were able to reach them, but not to market our product. All or part of the properties of our competitors were sold to the managers of the railroad.

Q. Was your principal competitor the Argan Refining Company? Was the competition simply local? A. The Southwestern officials, the managers of the railroad of which I spoke, became owners of a large block of the Argan stock. It made no difference what we would propose in our quotations, we were not able to sell them goods at any price, though our goods were just as goods as theirs. We lost a valuable customer.

Q. Had you been selling this product to the Baltimore and Ohio Southwestern Railroad? A. We had sold some to it, but more particularly to other roads leading out of Marietta, i. e., the Cleveland and Marietta and Zanesville and Ohio.

Q. Was the Standard Oil Company at that time connected with this competing company? A. Not that I know of.

Q. You say you were deprived of the Baltimore and Ohio Southwestern, one of your most valuable customers, on account of some of the managers becoming stockholders in the Argan Company; but how did you lose your other customers? A. The other customers were located along the lines of those railroads and their several branches. We lost not only the railroad company itself as a customer, but their handling the product of this one concern enabled the merchants and dealers along the line to get oil at rates that we were not able to compete with.

Q. So that was really the reason of the stoppage of your refinery? A. That was one of the reasons.

EXPERIENCE IN REGARD TO TRANSPORTATION.

Q. Did you have reason to think they were getting advantage on freight rates? A. We had no direct evidence of it, but we supposed it; they were acting very strangely; our information was only circumstancial; we had no means of knowing. We believed that we manufactured as cheaply as they did, and our freight rates being equal we ought to have controlled some of the trade, but we were unable to do it.

Q. What was your experience with reference to the transportation of the crude oil to your refinery, etc.? A. We had our own lines from the wells at Macksburg to the railroad; from there we shipped it in tanks to the works. I became interested in the Corning field, in Perry county.

PRODUCT OF MACKSBURG OIL FIELD COMPARED WITH THAT OF OTHER FIELDS.

Q. So far as your experience as a producer in the Macksburg field is concerned, did you have difficulties there—trouble with refining? A. Yes.

Q. (By Mr. Phillips.) Is the Macksburg field product what is commonly known as "white-sand oil?" A. Yes; the crude is the same as white-sand oil, and commands a similar price in the market.

Q. It is not the Lima field oil? A. Oh, no.

Q. (By Mr. Jenks.) What were you going to say about the Corning field? A. The Corning field was developed later; some of the people who owned the Maxburg field opened up the Corning field. Corning is about 40 miles northwest from Marietta, along two or three lines of railroad reaching Marietta. We undertook to market that oil or get some of our product to our works. We had some wells there.

Q. (By Mr. Phillips.) What kind of oil was that—was it the same as obtained from the Berea or the same as the Pennsylvania? A. That is a little different grade of oil, or at least there are some products in which it is not as rich as the Macksburg; there is just a little difference. They make a difference of 17 cents a barrel on the price. It is now being marketed for 17 cents less than white-sand oil.

Q. But it is white-sand oil nevertheless? A. Yes; we finally succeeded in getting a test of two or three tank cars, and we decided that in many respects it was just as valuable as white-sand oil, but we could not get it to our works by the railway for less than 15 cents a barrel more than we could get the white-sand oil for from the pipe line company. Then we undertook to gather it up from the fields and take it through their pipe lines.

CHARGE FOR PIPING OIL.

Q. Through what pipe line? A. The Buckeye Pipe Line; we bought that oil from them delivered to our works through their pipes.

Q. Did they pump the Lima oil through the same pipes? A. No, the Corning oil; that is quite a long way south Lima is 75 miles, at least, or 100 miles away.

Q. (By Mr. Jenks.) Do you mean that the pipe line company buys this Corning oil at 17 cents a

barrel less than they would pay for the higher grade of oil that you have in the other field? A. Yes.

Q. And was this same oil then carried to your refinery? A. Yes, but instead of charging us 20 cents a barrel for the pipage they charged us 35 cents.

Q. Will you explain the significance of that? A. It would be 17 cents less a barrel to the producers at their wells. We discovered that the oils in many ways were just as good or better than the oils people were paying $1.13 for at the well, with 20 cents pipage. We could make a better product from that; but if we had to pay 17 cents a barrel more it would bring it down to where it was more profitable, or just as profitable, to ignore that and take our own product and sell it to the Standard Oil Company and buy from them a different grade of oil at about the same price.

Q. (By Mr. Jenks.) That is to say, they would buy oil from you, as producers of course, at 17 cents less than they would pay for this better quality of oil from the Macksburg field, and then sell the same oil to you as refiners at the same price as the highest quality of oil? A. Yes.

Q. So that as producers you were losing 17 cents, and as refiners you were gaining nothing. When they bought the first grade of oil, did they claim that it was inferior? A. Yes.

Q. And when they sold it to the refineries, they claimed that it was as high a quality as any that could be gotten? A. Yes.

AMOUNT OF OIL PRODUCTION.

Q. How does the amount of this white-sand oil produced in Ohio compare with the amount of the Lima oil? A. I am not familiar with that; the pipe line people make a monthly statement of the oil they produce and the amount in the different fields, and I know only in a general way about it. I suggest that that is a matter which you can get directly from their statistics. They furnish their purchasers or the dealers with a printed statement, as many of you gentlemen know, I presume, which is sent out about this time of the month.

Q. (By Mr. Phillips.) Is not the Lima production much the larger? A. Oh, yes; the production of the Lima fields, according to my recollection, is about 60,000 barrels a day.

Q. (By Mr. Jenks.) Then the high quality of oil from the Corning and Macksburg fields is relatively a small part of the production of oil in Ohio? A. Yes; I should think our field produced about 10,000 barrels a day, or in that neighborhood.

Q. You spoke of the advantage which your competitors had as producers on account of the pipe line connections. Will you make this point a little clearer? A. As producers we were not able to get our own products to our plant without being subjected to all the extra charges which I have already mentioned.

Q. Extra charges of the pipe line? A. Yes.

RAILROAD CHARGES FOR SHIPPING OIL.

Q. How about charges on the railroad? A. We were not able to get rates on the railroad at all satisfactory; they make it no less to us than the higher rate of pipage.

Q. Had you any reason to think there was any special discrimination of rates being made in the transportation of crude oil? A. We were compelled to get our oil in tank cars from two lines of road. One was the Toledo and Ohio Central, which had a branch running to Marietta. I made application for rates by wire, but I think it was at least thirty days before I got them to give me a rate at all; and when they did I found it would cost me about one cent a barrel more than to ship by the pipe lines; i. e., 35 or 36 cents a barrel.

Q. Did you infer from the delay that the railroads were more or less in the control of your competitors in the field? A. Yes; it seemed so to us. We put our own loading racks and our own lines to the tanks, and paid the same transportation rate as we would have paid if we had bought it direct.

Q. Do you know whether these special appliances required of you in the way of loading racks were also required of the Standard Oil Company? A. No, I do not.

Q. (By Mr. Phillips.) Were you ever engaged in litigation in regard to freight rates with the Standard Oil Company? A. No.

Q. Was there any litigation in regard to freight rates in your section of the country with which you are familiar? A. Mr. George Rice and Mr. McCarty had litigation, and, as I remember it, recovered finally from some of the transportation lines; but they afterwards became a part of the Standard Oil Company or the Buckeye Pipe Line. I was not engaged in the business at that time, and so did not familiarize myself with the case. I saw what was published in the newspapers and heard the case talked about.

Q. You yourself had no direct experience at that time? A. No.

THE OWNERSHIP OF THE OIL FIELDS.

Q. Was there any difficulty in buying up new oil fields? A. Well, there has been a good deal of property bought. After territory is found to be good paying property it is bought up very largely by some of the different branches of the Standard Oil Company; one, perhaps, will be the South Pennsylvania Oil Company, another the Ohio Oil Company, another the Carter Oil Company, another the United States Oil Company, etc.

Q. Are all these companies connected with the Standard Oil Company? A. Yes; they are all believed to be. I have no positive information as to that, but it is a common supposition that they are.

Q. But do you know as a matter of fact that the Standard Oil Company is connected with a large number of producing companies and has organized a large number? A. I have no positive information, but it is currently believed by all the oil people about Marietta that it is.

Q. (By Mr. Jenks.) Does the purchase of these oil fields by the Standard Oil Company, or the companies associated with them, simply mean that they have plenty of capital and can pay higher prices than their competitors? A. Yes.

Q. Have you any reason for believing that there is anything unfair in their methods of dealing in this respect? A. No; I have not. I have seen large properties sold to companies which we believed to be connected with them; they have always paid very fair prices; in fact, almost exorbitant ones in some cases.

Q. Is it simply a question of having a large capital at their disposal, with a willingness to pay well for the property they want to get control of? A. Yes.

CHARGES OF PIPE LINE COMPANIES, ETC. (RESUMED.)

Q. Let us go back again for a moment to the question of transportation and the charges that are made by the pipe line companies. Did you pay by the barrel? A. Yes.

Q. About how much does the barrel contain? A. Forty-two gallons is the Standard Oil Company's quantity; that amount is delivered or supposed to be delivered for a barrel of crude oil; formerly it was 41, but it has been 42 for a number of years. They have their own experts for gauging the tanks and make out their own gauge tables. Where a producer requests it they will furnish a duplicate, showing the capacity of each tank for each inch in height or depth. The producer can have a representative there when the tank is gauged. The producers soon got used to the system and paid no attention to it. The amount is reported to the pipe line company and credited on their books, and you can sell your oil whenever you please, 42 gallons for the barrel. I believe, however, they take up 2½ per cent. for wastage by evaporation in addition to that.

Q. Why is that done? A. It is claimed by these people that that is about the fair average of the shrinkage or contraction by the leakage and evaporation.

Q. Then there is a waste when oil is handled by barrels or placed in tanks? A. It is never handled in barrels, but always in tanks and pipe lines.

Q. So this waste, they claim, exists in the pipe lines themselves? A. Yes.

Q. If you buy a thousand barrels of oil, will they deliver about 2½ per cent. less than that because of this wastage? Is that the idea? A. No; they will deliver to your credit so many barrels of oil and have the wastage of 2½ per cent. estimated or computed from the gauges.

Q. That is, when they are buying oil from you? A. Yes; when they are buying oil from us.

Q. Is that practically the universal custom in the case of all pipe lines? A. We have not had, for a number of years, any pipe line in the country but the Standard.

Q. They buy from you and pay you a certain amount, less 2½ per cent., which they claim as wastage? A. Yes.

Q. (By Mr. Phillips.) Is it a fact that the Standard Oil Company have a large amount of sediment or surplus? A. Yes.

Q. Do you suppose that is accumulated from this 2½ per cent.? A. Of course I have no definite information as to that. It is supposed that we buy a part of it and that they also charge or assess for insurance on fire losses. It occasionally happens that a tank of oil is burned up.

Q. Is that asssessment made on the producer in the particular division or locality?

Q. (By Mr. Jenks.) How is the assessment calculated? A. By reducing the credit balances. If you have 1,000 barrels, and 1 per cent. would take up the total loss, they charge it up.

Q. (By Mr. Phillips.) Have they any legal authority to make an assessment? A. I think it is mutual; I do not know whether or not it would stand in litigation; I have never known of anyone objecting to it.

Q. Have you ever known of any person bringing a suit to recover? A. No; they object, of course, but I have never known of anyone making a claim for it.

Q. The fact is, then, that this is generally quite a small amount on each producer, and that they do not feel justified in going to law in regard to it, but there is no law that could assess? A. No.

Q. But do they do it, nevertheless, generally? A. Yes; I understand so.

THE NECESSARY CAPACITY OF A REFINERY.

Q. (By Mr. Jenks.) How large a refinery did you have? What was the capacity? A. Well, about 8,000 barrels a week was our capacity; of course we could increase it at any time if the trade demanded it.

Q. Is a refinery of that size, properly built and equipped, able to refine oil as advantageously as one considerably larger? A. Well, it would be confined to one or two branches of the refining business—that is, the manufacture of illuminating and lubricating oil. But if one had a gasoline plant connected with the refinery it would add very materially to the profits.

Q. That is to say, in connection with every refinery there are a certain number of by-products which can be used to very great advantage as soon as your plant is large enough so that you can afford it? A. Yes.

Q. Do you have to have special facilities for that use? A. Yes.

Q. What do you do with these by-products that you have? A. We sell part of them to Scofield, Schurmer & Teagle, of Cleveland—paraffins and benzines. We have a good market for our surplus there, but never at a profit. We would just about get rid of it without carrying it in stock. We never were able—at least, we never seemed to be able—to get any profits out of by-products.

Q. Can you give any definite idea at all as to how much more profitable your establishment would have been had it been large enough for you to make the best use of the paraffin and other side products which you were compelled to dispose of substantially at cost? A. I have never made any estimate of that. It would be a mere approximation if I should, not having gone into it. I should have to make some little calculation, which I think would be foolish to attempt, because it would only be an approximation. It might differ quite a little from the real facts, if they were determined.

Q. If you had had double or treble the amount of

capital in your plant, with additional facilities for making use of the by-products, do you suppose that, selling your illuminating and lubricating oils at the same prices as before, the added profits from by-products would have enabled you to pay dividends on the capital and keep your establishment running, whereas the experience you did have compelled you to close down? A. Yes; I think so. I think if such a profit had been secured the business could have been continued successfully.

STANDARD OIL COMPANY'S MONOPOLY OF BY-PRODUCTS.

Q. (By Mr. Phillips.) Is it, or is it not, a fact that the Standard Oil Company has practically a monopoly of all these by-products, so that if your business had been increased you could not have found a market for any of them? A. The by-products would have gone up to consumers, of course. We should have no occasion to sell by-products if we could manufacture them and put them on the market. If we were selling crude by-products, with our regular product, to a customer, and we introduced a special arrangement for using these by-products in their crude state, we could not make any profit from their immediate sale, and of course we should lose that customer.

Q. If you had facilities for manufacturing a very large amount of lubricating oil, does not the Standard Oil Company so monopolize that trade with the railroads that it would be practically impossible to market in competition with them? A. The railroads are large consumers of low-grade lubricating oils, and unless you can get some connection with the railroad companies that consume them in large quantities, it is almost impossible to get around to the small dealer and market at a profit. The Standard companies practically have got such control that you must either get some railroad in with you or sell your by-products to some of their concerns, to be compounded into their grades and marketed.

Q. Is it not conceded by what we call the independent or outside refineries that the Standard Oil Company has practically a monopoly of the lubricating business, especially among all the prominent railroads? A. Yes.

Q. Would any big corporations, independent of the Standard Oil Company, be safe in investing $500,000 or $1,000,000 in manufacturing lubricating oil? Would there be any certainty of finding a market for it? A. I think it would be a rather hazardous undertaking; that is my judgment.

Q. (By Mr. Jenks.) If I understand what you say on that point, the substance is this: That a very large establishment that can put in the needed facilities for making the best use of the by-products has a decided advantage in the manufacture, but that, owing to the fact that the Standard Oil Company has apparently such close relations with the railroads and with the producers of these by-products, it is nevertheless a hazardous investment to make, owing to the difficulty in marketing? A. We look upon it in that way and have not made such an investment in our concern.

Q. But the advantage in the manufacture itself, you think, undoubtedly exists? A. Yes; I think so.

THE COMPOUNDING OF OILS.

Q. Can you give us some idea with reference to the way in which the different grades of oils are compounded? A: I do not know whether I can make myself understood about that. Most refineries have a department of that kind. They have a person who becomes expert in compounding mineral oils with animal oils, and in the filtration and extraction of oils from the paraffin. There is a very great difference in these different grades of oil in the markets. One consumer, in many cases, may pay five or six times as much for a particular grade of oil as some other consumer. For instance, 15 cents a gallon would be a fair price for some consumers; and for some grades of oil they get 75 or 80 cents, owing to the particular machinery that is used.

Q. If I understand you, then, the manufacture of lubricating oils is very largely a matter of compounding? A. Yes.

Q. And that is an art in which there is a chance for experience and the development of skill? A. Yes.

Q. But nevertheless the art of judging accurately the quality of lubricating oils is a somewhat difficult thing? A. Yes.

VARIATIONS IN THE PRICE OF LUBRICATING OIL.

Q. So that if a person is disposed to get two prices, or three or four prices, for the same quality of oil from different consumers he might be able to do it? A. Yes.

Q. Have you any reason for believing that any of your competitors were in the habit of getting different prices for the same grade of lubricating oil? A. Yes; we have become satisfied of it by coming in competition with them. The grades of oil we were manufacturing in the same town would often be selling at 22 and 23 cents a gallon, while they would be selling to the very same people with whom we came in contact for 70 and 80 cents—in a small way, of course.

Q. Who were those competitors? A. The principal one was the Argan Refining Company.

Q. What was the source of your information on this matter? A. We were located in the same place and our plants were close together. Our men intermingled, *i. e.*, they would work at one place for a few weeks and then change about, so that we became somewhat familiar with what our competitors were doing, as they seemed to be willing to get information about us.

Q. Your information, then, on this difference in prices came from men working for you who formerly worked for the Argan? A. Yes, or vice versa.

METHODS ADOPTED BY COMPETITORS TO SECURE INFORMATION.

Q. You intimated just now that your competitors sometimes secured information with reference to your methods of doing business in ways that were ordinarily not considered normal. What were some of the methods employed? A. On one occasion we had an office

boy who became shipping clerk, and attended to making shipments of oil by river and by rail. That young fellow was approached by an agent of the Standard Oil Company, who offered to pay him for a report from day to day, giving the names of the persons we were shipping to, the points shipped to, and the invoice price of the product.

Q. What was the result of that offer? A. Well, the young man was very much surprised, but was loyal to us. He came and gave us all the information he had. We advised him to go further and get further information, but the other people weakened. I guess they suspected we were getting onto their schemes; they never accomplished it, so far as we know, unless it was done without our knowledge. Sometimes in the evening, after we closed up, the office man would be the last one to leave. They held conferences once or twice right in our office and tried to induce him, for a consideration of a suit of clothes, or so much per month, or something of that kind, to give them that information.

Q. On this special case you think they failed to get the information they wanted on account of the fidelity of your assistant? A. I think so.

Q. Do you know any other case in which they did get information along this line? A. I did not have any positive information, but we believed that every barrel of oil shipped from our works either by steamboat or by rail was in some way reported to our competitors. That was only a matter of belief and conjecture, but the circumstances pointed strongly in that direction.

UNDERBIDDING OF COMPETITORS.

Q. What were the circumstances that pointed in that direction? A. Why, when we would make a shipment of oil and send invoices, their traveling men would frequently come in contact with that particular shipment; the people that we shipped to would write us saying that they had a quotation at a lower price, and in many cases we would have to meet that price or lose the customer. We would have to make a deduction on the invoice, or make an allowance on the next shipment, or something of that kind. Of course, it created a great deal of dissatisfaction. We would have to keep a man on the lookout all the time, traveling from one little town to another to see the small dealers.

Q. That is, then, I infer, practically a universal custom with those people; wherever you had a customer they would follow you up? A. Yes.

Q. (By Mr. Phillips.) As a rule, did they sell lower than you offered to sell? A. They offered it, and we ultimately would lose a customer unless we reduced the price.

Q. (By Mr. Jenks.) What was the effect of this operation? Did it reduce the price of oil to the consumer? A. I think not.

Q. Why not? A. The dealer would not change his price; he would continue to sell the oil and if he bought it at the same price offered by the Standard he would have advantage of the difference in price. The dealer would get the advantage of the difference in price.

Q. Do you think, then, that the price of oil was lower to the dealers and that they made better profits than they would have made save for this action of the Standard Oil Company? A. Yes.

Q. (By Mr. Phillips.) Was that only in particular localities? A. Yes; in localities where we were seeking a market. It may have been so in other localities, of course, but I have no information on that.

GENERAL EFFECT OF THE COMPETITION.

Q. (By Mr. Jenks.) What do you think has been the ultimate effect of this competition which you said finally compelled you to go out of business? Have you any reason to believe that prices have increased? A. Generally, I think they have been restored to a more uniform condition; in many localities they would get the same increased price.

Q. So that the general average of prices is probably higher? A. Yes.

Q. This cutting prices was ordinarily to satisfy customers at particular places? A. Yes.

Q. And was not a general cutting? A. No.

COMPOUNDING OF OILS (RESUMED).

Q. To go back to the question of mixing oils. Did you say that nearly all refineries have a special department for that work and a special mixer? A. Yes.

Q. And that a good many different brands are made in practically every refinery? A. Yes.

Q. Is all this to satisfy, so far as possible, the tastes and desires of different customers? A. Yes.

Q. And were you in the habit of making special brands for special customers? A. I do not think we did in lubricating oil, but we did in illuminating oil. Sometimes we found the same name used on oil that was manufactured by other concerns, apparently for the purpose of getting out under our brand. We had one brand that was considered superior by many consumers.

Q. What was that? A. It was called the Champion.

Q. And you had reason to believe that brand was sometimes used by your competitors? A. Yes.

Q. And put on an inferior grade of oil? A. Yes.

Q. Have you any specific instance in mind of an attempt of that kind or an attempt to make your customers believe that your oil was not up to the standard? A. Yes; I think of one particular case, that of the Cleveland & Marietta Railroad. They were customers of ours and we branded all of our oil under the brand that we were shipping it at. We supplied them with lubricating as well as illuminating oil. In one case we were informed by the purchasing agent that their inspector had discovered five or six gallons of water in some of the barrels of the last shipment we had made. We at once took the matter up and investigated it, and found that every barrel we had shipped out—at least every barrel of that particular invoice—was accounted for by having our brand on it. The other barrels, which it was claimed had water in them, had no brands at all. We had no information as to where they came from, but some one undertook to deprive us of that customer by sending a shipment of spurious oil and

then trying to make the particular officials think it was our product.

Q. Did you say there were four barrels that had water in them? A. Yes; I think there were four or five barrels.

Q. Did you think that somebody stole four barrels of your oil and put this spurious oil in the place of it? A. I do not know; I know ours had all been counted up and distributed along the line, and it was difficult to go to each point and to each agent that distributed it and find the barrel with the shipping mark. The four or five barrels of spurious oil had no marks to show where they came from. It may have been ours, but I do not see how it could have been unless somebody opened the barrels and put the water in.

Q. So there must have been some fraud in that special case? A. There was no doubt of it in our minds; we investigated it very carefully, and it resulted in establishing our reputation with that particular road, so that as long as we continued in the business we had their entire trade; the way it happened it turned out fortunate for us after all.

Q. What would have been the effect had you not been able to establish your case? A. It would have ruined us.

Q. You would have lost that trade? A. Yes.

THE COST OF PRODUCING OIL.

Q. How does the cost of producing compare with what it was a few years ago? A. It is less. Fuel is somewhat less, owing to the locality, of course. Coal has been cheaper for three or four years than it was ten years ago; and where natural gas is used the uniform price, I think, throughout the country is seven cents for each barrel of crude oil. Some of the chemicals that are used in the manufacture of oil are quite a little less. Sulphuric acid was 2½ cents, and is now about one cent a pound; but that is not a very material part of the cost.

Q. So that on the whole you think the cost of refining oil has decreased a little of late? A. Yes.

Q. Do you have any difficulty in getting the material which you have to use at good prices? A. No; not at all. In the case of the last we bought we had a contract by the year with the Standard Oil Company. We bought our sulphuric acid and other chemicals from them.

Q. Is it generally true that refiners of oil, who are competitors of the Standard Oil Company, have to buy material, for example, sulphuric acid, from them? A. Yes; generally.

Q. Do you not think they might be put at something of a disadvantage in that way? A. Yes; possibly. Although the last we bought from the Standard Oil Company was cheaper than people could get it elsewhere.

Q. (By Mr. Farquhar.) Is it not generally the case that sulphuric acid and other materials used in refining oil can be purchased from the Standard Oil Company cheaper than in any other market? A. Yes; I think that is right.

COMPOUNDING OF OILS REQUIRES KNOWLEDGE AND SKILL.

Q. Is the compounding of oil a scientific operation or simply a haphazard one? A. Well, there is a great deal that is haphazard; it is now becoming more a custom to go into it carefully and scientifically; but from my observation of refiners generally there is as much haphazard work in the compounding of oils as in any other business in manufacturing.

Q. If you were engaged in the compounding of lubricants would it not be your custom to send to the scientific schools for a full analysis before marketing the produce itself? A. It is sometimes required, but we do not always do it; it entails more or less expense that all want to avoid, if possible.

Q. Is it not generally a fact that many refineries have mixers or compounders now? Are mixing and compounding considered scientific attainments? A. Yes.

Q. Is not the compounding of lubricants and illuminants taught in every scientific school in the country? A. Yes; and in a great many colleges.

Q. Is it taught at Cornell University, for instance? A. Yes; and at the Ohio State University at Columbus.

RAILROADS PREVENT FAIR COMPETITION.

Q. In your business with the railroad companies, how close were the prices of the Argan or other competing companies to your own? A. Well, our experience soon led us to understand that any price we might make the railroad companies that they had control of would cut no figure; we had no means of knowing what they got; for instance, if they were getting 12½ cents a gallon and we offered it for 6 cents, we could not get that. We knew they were selling at 12½ cents to other people; of course, we do not know just what controlled it, but we were not able to get the trade.

Q. (By Mr. Jenks.) Did you, as a matter of fact, make the price lower to the railroad than to other customers? A. For a few times, just to satisfy ourselves that that was the condition of things; after that we paid no further attention to that particular trade.

Q. (By Mr. Farquhar.) What official of the Baltimore & Ohio Southwestern Railroad controlled the purchase of lubricants? A. They had a purchasing agent, who was not always the same party, but it seemed that a higher authority controlled their sending our requisitions for the oils they needed. A complete change was brought about in their methods of doing business, and soon after it was known that the officers of the road controlled considerable stock in the Argan Refining Company.

Q. Were the parties interested in the railroad also interested in the Argan? A. They finally acquired, as we believe, at least 50 per cent. of the stock of the Argan Refinery.

Q. The oils, of course, were called standard? A. Yes.

Q. Do you claim that the Argan was better or

poorer oil? A. It was intended to be substantially the same grade.

Q. Was it left to the purchasing agent to make a decision himself? A. Oh, yes.

Q. Then do you wish to impress upon the commission the idea that preference was given to the Argan Refinery because the railroad officials were interested in it? A. Yes; that is my belief.

Q. Have you no knowledge? A. None whatever, except the circumstance which led us to that belief, the general condition of things, and the fact that we were not favored with a part of their business.

Q. Can you tell the commission, from your own knowledge, whether the Standard Oil Company offered better terms than you did to the railroads? A. No.

Q. (By Mr. Phillips.) Did you say that you offered to sell at a much lower rate, and that they refused to purchase your oil? A. Yes.

Q. Is that the reason why you think there was unfair competition? A. That is it exactly.

Q. Do you believe it or know it? A. We believe.

Q. Because they would not purchase your oil, of equal quality at a much lower price than they were paying others? A. The influence did not stop at that particular point; but the fact that it was known along the entire mileage of that railroad and its branches that they were getting their illuminating and lubricating oils from this particular concern we believe influenced the dealers along the line, because they could get it in small quantities and without very much trouble. The same people being interested in the railroad and the Argan Refinery made, we believe, quite a difference in our trade along that line; we may be mistaken about it, but it so appeared to us at the time.

Q. (By Mr. Farquhar.) Do you not usually find that it is a pretty difficult thing to hold a customer where you have competition of that kind? A. Yes; and especially when the matter is in the hands of a purchasing agent.

Q. Do you have any faith in the old saying that "The purchasing agent was bought on both sides?" A. I do not know. They laughed at the statement, and so far as our concern goes we did not try to influence or trade in that way at all. It was on its merits, for what its value was; and so far as I know, we had no string to the purchasing agent of any company that dealt with us.

THE STANDARD OIL COMPANY AND THE PRICE OF OIL.

Q. (By Mr. Phillips.) It has been claimed that there has been a gradual decrease in the price of refined oil in the last twenty years, or since the Standard Oil Company began manufacturing oil. Now, is it or is it not a fact that that decrease is obtained by using quotations from New York, chiefly on export oil? Is it or is it not a fact that benzine, which is now higher in price than refined oil, was, in the early history of the refining business, dumped into the creek, and that the tar was not even used as fuel? A. Yes.

Q. Are not the by-products as valuable now, in many instances, or even more valuable than the refined oil itself? A. Yes.

Q. And by-products that were formerly considered useless? A. That is true, and when that condition prevailed there were great fluctuations in the value of the crude oil. As I remember, oil was at one time down to 37 and 40 cents a barrel, and at another time, when they were manufacturing just one grade, it sold as high as 20 cents a gallon. There were great fluctuations as to price of refined and crude oil. That may account for a part of this decreased price.

Q. (By Mr. Farquhar.) Do you not think that the fluctuations in the price of oil in 1872 were really due to overproduction, or do you think they were caused by monopoly? A. No; I think the cause was overproduction and the facilities for handling this crude oil.

Q. It was not a question of monopoly? A. We knew nothing of monopoly at that time.

Q. It was just a question of overproduction, when everybody was trying to sell and get the market? A. Yes; that, I think, influenced the price very considerably.

THE PROFITS OF THE STANDARD OIL COMPANY.

Q. (By Mr. Phillips.) Do you believe that the Standard has, in a great many instances during the last ten or twenty years, made more profit per barrel for every barrel of crude oil handled and manufactured into refined oil than they have paid for the crude oil itself? Is it right to infer, as some do, that they make more profit today on every barrel of oil that is manufactured than they pay for producing it? A. I hardly think they do, but they do make, as shown by their statements, a very considerable amount out of their transaction of oil through the pipe lines; they are very profitable.

Q. Take them together? A. Oftentimes the entire profit on a barrel of oil will be made on the transportation of it instead of the manufacture.

Q. (By Mr. Jenks.) Have the rates for piping decreased? A. That I do not know about. The Standard system has only been established at Marietta about ten years, and I know nothing of what may have occurred before that.

Q. Has there been any change in the charges for piping in your remembrance? A. Only at particular periods when there has been a contest over the control of a particular field, or something of that kind. I think they are paying 10 cents a barrel more for crude oil at Scio to-day than they are at Marietta or Pittsburg. The quotations show 10 cents a barrel more.

Q. Is the price of crude oil at Marietta the same it has been for some years? A. Oh, it has fluctuated some in the last five or six years, but not so very much.

COST OF PRODUCING CRUDE OIL NOW AND FORMERLY.

Q. What is the cost of producing crude oil now compared with what it was five or ten years ago? A. It has increased very much. The material, i. e., casing, tubing, and machinery, that goes into the

production of oil, has increased in some instances, I should think, 90 per cent.

Q. (By Mr. Phillips.) Since when? A. In the last three or four months.

Q. Prior to that was it cheaper than it had been before? A. Oh, yes; very much cheaper. All materials going into the production of oil in the way of iron pipe, tubing, casing, boilers, and machines were very much reduced.

Q. (By Mr. Jenks.) The price of these materials has gone up, and there has not been much increase in the price of crude oil? A. No, no.

Q. Do you know whether the Standard Oil Company itself is interested in the production of these supplies or not? A. No; I have no information other than the general supposition of people who are consuming those products. Quite frequently you will find that their business relations indicate that they are somewhat interested but I have no knowledge of my own as to that.

Q. (By Mr. Farquhar.) Do you mean that there are parties interested in the Standard who are also interested in the tubing works, etc.? A. Yes.

Q. But the Standard, as the Standard, has nothing to do with it? A. No; I suppose not.

Q. (By Mr. Jenks.) Did you say that your chief competitor in the refining business was the Argan Company? A. Yes.

Q. Your chief competitor, then, was the Argan and not the Standard? A. The Standard had a very large plant at Parkersburg that covered part of the same territory that we both covered.

Q. But so far as you knew you were hampered as much by the Argan as you were by the Standard? A. Yes.

RELATION OF THE STANDARD TO THE ARGAN REFINING COMPANY.

Q. Was the Argan owned by the Standard at that time: A. No.

Q. But it has since been bought by the Standard? A. Yes.

Q. What has been the history of the Argan since then? A. Why, the Argan Refining Company was leased sometime within the year, I should say, by one of the branches of the Standard Oil Company—the Southern Refining Company, I think—on a basis of 6 per cent on $200,000 for ten years, or, in other words, $1,000 a month for ten years. They had employed quite a number of people, traveling men and office men, and just recently they left Ohio and went into West Virginia. That was about the time, I think, that Attorney-General Monnett commenced quo warranto proceedings, claiming that they were a part of the Standard Trust. They immediately moved their business office to Parkersburg, which is about twelve miles from Marietta on the Virginia side of the river. Since then it has been understood that the people who owned the stock of the Argan Refining Company had capitalized it and sold out their entire interest to the same people that leased it; so that they have in some way discounted the ten-year lease by cash payments, and the Argan Refining Company has now practically abandoned its office at Parkersburg.

Q. It is understood that the purchasers of this stock are the managers of the Standard Oil Company to some extent? A. That is the supposition. I think if you have access to the testimony, taken by Mr. Monnett at Marietta, of Mr. Cram, who was the manager of the Argan Refining Company at the time this lease was made, you will find that he testifies as to just what was done in this leasing process. Since that time it is generally believed that the stock has been purchased by the same parties who made the lease. Perhaps you will not find that in this testimony.

NO SUGGESTION AS TO LEGISLATION.

Q. (By Mr. Phillips.) Have you any suggestions to make in regard to legislation regarding trusts and combinations? Do you think it is a question that can be dealt with properly by law? A. I have not given it the close attention that other gentlemen have, but I realize that it is one of the most difficult things to deal with or control by law. I have no suggestions on that line. I do not know how remedial legislation is possible; vested rights are acquired by innocent holders in different corporations and they are thrown together, so that I can not see how you can possibly separate them. There may be some way of doing it.

Q. Are you at all familiar with the pipe line business in Pennsylvania and Ohio, and especially in regard to the opposition the Standard has made to independent pipe lines? A. No; I never came in contact with that except in a very moderate way.

Q. You are not, then, familiar with the early history of the Standard in Pennsylvania? A. No; I am not.

Q. And their methods there in regard to pipe lines, purchasing refineries, etc.? A. No; I have no information in that direction.

Q. (By Mr. Kennedy.) To whom do you sell your product now? A. The crude oil?

Q. Yes. A. The oil produced in West Virginia I sell to the Eureka Pipe Line Company, and that produced in Ohio to the Macksburg division of the Buckeye Pipe Line.

Q. Are they both Standard Oil lines? A. They are in the same office and the same bookkeeper makes out the check which is given by one of their agents on New York.

Q. (By Mr. Phillips.) Are both owned by the Standard? A. Both are in the same office.

Q. (By Mr. Kennedy.) Do they pay you the market price for it? A. Yes.

REGULATION OF THE MARKET PRICE OF OIL.

Q. (By Mr. Farquhar.) How is the market price regulated? A. When you have oil to sell you go to the agent, who, before he gives you a price, wires to Pittsburg, where the books are kept, to see what your credit balance is; that is, the numebr of barrels of oil credited to your account and the particular grade. When he gets that information he will

give you the price; that is, the price is posted. You may or may not accept his offer.

Q. What influence have the independent producers of this country on the price of crude oil? A. They have influence only in special cases, and I do not recollect any of those in particular. I do not think they have any influence over it at all in our part of the country.

Q. None at all? A. Not at all.

Q. (By Mr. Phillips.) Is the price of oil there fixed by the board of exchange or by the Standard Oil Company? A. By the Standard Oil Company.

Q. Both crude and refined? A. They do not fix the price of refined, but they do the crude.

Q. They make the quotations in New York, do they not? A. I think they do.

Q. Do they make the quotations in all the oil fields for the crude? A. Oh, yes; wherever they have a purchasing agent.

Q. And is it wired to the agents what the price shall be each day or week, subject to change at any time by them? A. Yes; the holder of credit balances on their ledger may be a producer in Indiana, Ohio, West Virginia, or Pennsylvania and may sell to any of their agencies. It does not make any difference what one. I have often been in the office when producers in Indiana would come in and ask for their credit balances and get their checks just the same as men who produce oil within a mile of where the business was transacted.

Q. (By Mr. Farquhar.) Is it the New York branch or the Pittsburg branch that rules the market? A. It is the Oil City market; that is the one.

Q. Of the Standard? A. That controls the price of crude oil. Occasionally it is sold at quotations given by brokers when there is a little fluctuation. I have known it to be so for a few days, within two years, I think. When I go in to sell some of my crude oil they would say: "If you will allow us to put this on the exchange today, you may have the benefit tomorrow of the average exchange price instead of taking the specific or grade price at the time." I frequently would get a cent, a cent and a half, or two cents a barrel more by putting it on exchange. At other times the exchange was lower than the Standard market.

THE POSITION OF INDEPENDENT REFINERS.

Q. Is it your opinion that the independent refiners of this country are making money? A. I do not know outside of the firm I am interested in myself.

Q. Scofield, Schurmer & Teagle, of Cleveland? A. Apparently they are.

Q. Do they own oil wells? A. I really do not know.

Q. They are refiners proper of the oil and the by-products? A. That is what I understand.

Q. Is it not quite a wealthy firm? A. Yes.

Q. Has it not always been an independent firm? A. That has been the supposition.

Q. Do not large profits naturally accrue to a firm like that? A. Yes.

Q. Because a good many refiners have gone out of business, is it right to say that the Standard Oil Company drove them out or bought them out?—gave them a good price to get out? A. Why, take, for instance, our own concern right there under our eyes. I could have——

Q. (Interrupting.) Could you not have sold out in pretty good shape if you had desired? A. I was never approached on that. I would be very glad to, but I think I could have put up a refining plant as good as the one that was practically sold for $200,000 for about $75,000.

Q (By Mr. Jenks.) That is the Argan? A. That is the Argan.

Q. (By Mr. Farquhar.) Of course, that includes good will and everything else that goes into an establishment of that kind. But, from your own experience, do you know whether it is customary for the Standard, when they find a good, strong refining plant, to crush it out or buy it up at a pretty good figure? A. They have not done that in a great many instances. They did not buy out Mr. Rice's plant.

Q. (By Mr. Phillips.) Is it, or is it not, a fact that the Standard bought a large number of refining plants at a good price, and wrecked them? A. Yes.

Q. (By Mr. Farquhar.) Is it not sometimes a good business proposition to dismantle plants when you have been getting good transportation facilities and getting the same quantity of oil and other products and attach to another pipe line, and let them go, leaving nothing but the bare walls? A. Yes.

Q. As a business proposition, any man will do that? A. Yes.

Q. (By Mr. Kennedy.) What is the market price of crude oil to-day? A. The last quotation I saw was $1.13 at the wells.

Q. A barrel?

Q. (By Mr. Phillips.) White sand oil? A. The white sand oil.

COST OF PRODUCTION (RESUMED).

Q. (By Mr. Kennedy.) Can you state to the commission what the cost of production is? A. That varies a great deal; that is one of the uncertain quantities. I have spent a good deal of money in sinking wells with no return, but occasionally have been fortunate enough to get a well that was very cheaply produced and that gave a very satisfactory return. It is impossible to tell just what the cost is.

Q. In regard to the wells that are productive, can you say what the cost per barrel for the crude product is? A. That varies as to the field.

Q. What is it in your field? A. The nearest wells to Marietta are only about 400 feet deep and are very productive, while the Berea sand wells, in the Macksburg field, vary from 1,600 to 2,300 feet; therefore you can see that there is quite a little differnce in the cost of wells in different fields. You have to use a great deal more casing in some instances than others—three or four strings of casing frequently. In our fields you use but one, because of the surface drilling.

Q. (By Mr. Phillips.) The cost of drilling is about

$5,000 or $6,000 to the well in different localities? A. Yes.

Q. And some are more uncertain than others? A. Yes.

Q. (By Mr. Kennedy.) What is your own individual production? A. My own individual production?

Q. Yes. A. That varies considerably. It is now about 100 barrels a day.

Q. You have been in the business a good many years? A. Yes; I have several times thought I was in the business, but when I came to settle up I found I was not—I was behind.

Q. Is it not possible for you to compete now, if the Standard Oil Company does fix the price of the product? A. Yes, it is, where I get sufficient production to pay the expense of operating.

Q. (By Mr. Farquhar.) In a general way, do you think the exportation of petroleum over the whole world has been a great benefit to the country? A. Yes; I do.

Q. Do you think it has been one of the great factors in holding the balance of trade in favor of the United States? A. Statistics show that, of course; there is no question about it in my mind.

Q. (By Senator Mallory.) Did you not state, some time back, that the managers of the railroad at Marietta, being interested in the Standard Oil Company, influenced the dealers along the line of that road? A. The managers of the railroad company, being interested in the Argan Refining Company, made it appear to the ordinary village merchant that they were controlling that particular trade. In many cases they control the output of the coal mines that supply fuel for operating the road, and the managers and operators do their purchasing from the companies that are doing the work. In that way they secure indirectly control of the railroad company or the merchant.

Q. Do you mean the railroad employes? A. The coal producers, the coal operators.

Q. Purchase of the dealers? A. They were, in one instance, supplying the railroad company with their fuel and operating mines producing the coal, and of course they supplied them, or some one connected with them; not only the coal, but also the supplies that went into producing the coal.

Q. What I wanted to get at, or understand, was the influence which you referred to as controlling these dealers to their detriment? A. That was one. Wherever they had control, or were connected with the producing of coal or other things that were associated with the management of the road, they seemed to be able to cut us off.

Q. Do you say they had no direct influence? A. Not that we could put our hands on; we only inferred it; the circumstances impressed upon us the fact that it was going on.

Q. But you found it to be a fact that your business was being cut off all the time in various directions from various causes? A. Yes; we attributed part of it to that influence.

Q. To that influence? A. Yes.

Q. (By Mr. Kennedy.) A former witness before the commission said that he believed a new system of rebates to railroad companies had grown up. It is this: They furnish lubricating oil to the railroad companies, who pay them a great deal more for it than it is worth in the market. Do you know anything on that subject? A. No; I do not; I have no information on that subject further than I have related.

WAGES PAID IN THE PRODUCTION OF CRUDE OIL.

Q. How do wages in the oil business compare with wages in other industries? A. What branch of the oil business; the drilling?

Q. Yes; the drilling. A. I think the wages for drilling have been fairly kept up. An expert driller commands from $4 to $5 a day for his services in our fields. The tool-dressers get about $3 to $3.50 a day; I believe that is about the range in our country.

Q. How about the pumpers? A. That, of course, depends upon the amount and the number of wells they have to care for. Their wages run from $40 to $70 a month in our field. Rig builders, *i. e.*, the people who put up the derricks, are getting fairly good prices. The contractors, the men who do the drilling and furnish the machinery, are getting from 60 to 80 cents a foot for drilling.

Q. The Standard has very little to do with fixing the wages in the fields? A. Yes; so far as the drillers are concerned, except when they may be interested in drilling wells, as they sometimes are. I know of one piece they bought which only had one well on it at the time. Now I think they have 20 on that property. Of course, they were interested in the drilling of those wells, which is usually done by contract.

Q. Is there any form of organization among the workingmen in the oil fields in your country. A. Not that I know of.

HOW OIL LAND IS HELD.

Q. (By Mr. Farquhar.) Is it generally the custom to lease oil lands or purchase them outright? A. The custom with whom?

Q. With the operators who sink wells? A. In a great many instances they lease on a royalty interest to the lessee, but they frequently buy. If they can make a satisfactory price they will buy the fee and the royalty interest as well.

Q. The rule is to lease, is it not? A. Yes; generally.

Q. (By Mr. Phillips.) Do they pay the rental until such a time as they care to drill upon the lands? A. Yes; if it is producing, they buy the right to continue operating and are at the entire expense of producing the oil and pay a royalty of one-eighth; one-eighth is the custom all through that country.

Q. (By Mr. Farquhar.) What is the usual time of oil leases? A. From 10 days up to 20 years.

Q. Twenty years? A. Most of them, or as long as oil is found in paying quantities.

Q. (By Mr. Phillips.) Do you mean by 10 days simply the time to begin operations? A. Yes; that is it.

Q. Then the lease holds as long as oil or gas is produced in paying quantities? A. Yes.

Q. Have you anything to state yourself that we have omitted that will be of benefit to the commission? A. No; I do not think of anything.

MOST BUSINESS MEN FOLLOW LIKE CUSTOMS.

Q. (By Mr. Ratchford.) Do you know of any business methods practiced by any of these refining companies that would not be practiced by others if they had the same power? A. I have given that subject a great deal of careful consideration, and I have never discovered it yet.

Q. You have never discovered any? A. No.

Q. Is it your opinion that these rival companies, battling against each other, use every means at their command to gain control of the markets? A. I think that is the rule; yes.

Q. What effect has this in the end on the consumer? A. It affects different localities differently, I believe. When you get far away from the oil centers, and give one or two concerns the opportunity to increase the price, it is my experience that they are going to do it, and do it right straight through.

AFFIDAVIT.

State of Ohio, County of Washington:

I swear or affirm that the statements made by me of my own knowledge in the foregoing report of my testimony before the Industrial Commission are true, and that all other statements I believe to be true.

THEO. F. DAVIS.

Sworn and subscribed before me this 18th day of September, 1899.

[Seal.] HENRY G. BOHL,

Notary Public in and for Washington County, O.

Washington, D. C., June 9, 1899.

TESTIMONY OF MR. THEODORE B. WESTGATE,

REFINER OF OIL.

The commission met at 10:50 a. m., Vice Chairman Phillips presiding. At 12:20 p. m. Mr. Theodore B. Westgate, oil refiner, Titusville, Pa., appeared and testified.

Q. (By Mr. Jenks.) Will you give us your full name and address? A. Theodore B. Westgate, Titusville, Pa.

Q. You are a refiner of oil? A. I am.

Q. How long have you been engaged in the business? A. About 13 years.

Q. Are you also interested in the production of crude oil? A. To a small extent.

Q. In what way? A. I am producing a little.

Q. As an independent refiner? A. Yes; it is so little, however, that it is hardly worth mentioning.

Q. Do you have your own refinery at Titusville? A. Yes.

Q. Are you associated with any of the independent producing companies? A. Yes; I am.

INDEPENDENT OIL COMPANIES—EFFECT ON PRICES.

Q. What ones? A. The Producers and Refiners' Oil Company, Limited, of which I am one of the managers. That is a transportation company. I am also a director in the Pure Oil Company, which is a marketing company.

Q. We have had some testimony here before with reference to the Pure Oil Company and its competition with the Standard Oil Company in New York City, Philadelphia, and perhaps other places. Can you give us any information with reference to the effect on prices of the competition of the Pure Oil Company? A. Upon our opening up an agency in New York City the prices immediately dropped. We did not drop them, but the Standard Oil people did, and without any corresponding decline in crude oil. I cannot tell you the exact figures, for I have not my papers here. I can give it to you later, if you wish. There was quite a material drop. (Supplied August 19, 1899. "On March 20, 1896, the day the Pure Oil Company commenced selling Water White oil in New York City, our price and the Standard's was 9½ cents. On March 26 the price was cut by the Standard to 8 cents. This price was gradually dropped, until on April 4 it was 7½ and 7 cents.")

Q. (By Mr. Phillips.) So much so as to take away the profit? A. Yes; entirely. Oil was sold at a loss by the Pure Oil Company in New York City.

Q. Do they still continue to sell at a loss? A. Yes; it is still sold at a loss there.

Q. (By Mr. Jenks.) Do you recall any other places beside New York City where the Pure Oil Company went in as a competitor and followed prices down until it was selling at a loss? A. Philadelphia, Pa.

Q. Will you tell us regarding the different qualities of oil that you refine and the difference in prices of those various qualities? A. Taking the prices to-day as a basis?

Q. Yes. A. Do you wish me to state the qualities—that is, the brands—as I put them out?

Q. Yes; if you will. A. My highest grade of oil now is Sunlight, double refined. That is worth at the refinery to-day, in bulk, 4½ cents per gallon. My next lower grade is Headlight oil, which is one-fourth of a cent less per gallon. These grades of oil are water-white oil. My next grade of oil is Diamond Safety, which is one-fourth of a cent per gallon less than the last grade. My next grade is Silver Star, which is not water white but prime white. The first three named are water white, 150 fire test; the Silver Star is prime white, 150 fire test. I make 120 water-white oil, which is worth 4 cents a gallon. Export oil to-day is worth 3.90 at the refinery.

Q. Are these all the different grades you make? A. Yes.

Q. And there is a difference in price between them? A. Yes.

METHOD OF BRANDING.

Q. In branding these oils do you vary the brands at all to suit the whims of the individual customer when the oils are of the same grade? A. Yes; I do;

but I do not sell my Sunlight, double refined—my high-grade oil—under the brand of Diamond Safety; neither do I sell my Diamond Safety oil under the brand of Sunlight. A customer in northern New York may want his special brand put on my Sunlight, double-refined oil, and may call it Arc Parlor or Silver Star. Another man in Massachusetts may call it Starlight. There are 30 or 40 different brands that can be placed upon the same grade of oil with all due credit and due justice to the refiner as well as to the purchaser and customer.

Q. In that way you vary the brand to suit the wish of your individual customer, although you do not put a brand that would imply a high-grade oil upon what is really a low grade? A. No; I bill it out under the name of Starlight. I do not take the brand on the barrel. It goes in my invoice as Sunlight, double refined.

Q. But you let him sell it under whatever name he chooses? A. Under whatever he chooses; under the name of Standard Oil, if he chooses. I have no names used by the Standard. In northern New York my Sunlight, double refined, put in yellow barrels and branded American Oil Works, Limited, Sunlight, double refined, 150 water-white oil, was giving such entire satisfaction that they immediately began to copy the brand.

Q. You say "they?" A. I mean the Standard Oil Company. They put their name on the outside of the circle. I do not think I lost any customers by that. It only went to show that I was giving a high grade of goods; and anything that is worth imitating is certainly a good article; it was not injurious to me.

Q. (By Mr. Phillips.) Was their quality as good as your own that was upon the market? A. That I do not know. I received empty barrels of theirs from Potsdam which my customers had picked up, and which went to prove what my salesmen had testified to and written me.

METHODS OF THE STANDARD OIL COMPANY IN MEETING COMPETITION.

Q. Can you give us any further information with reference to the methods of competing employed by the Standard Oil Company which you may have gathered in your business? A. Sometimes the competition is very agreeable and runs along smoothly, and then all of a sudden there will be an outbreak, not in all localities, but in some particular locality. Whether that is occasioned by my refinery putting in too large a per cent of refined oil, I do not know. I wish you would bear in mind that I have no understanding with the Standard Oil Company as to how much oil I shall put in any district. They, however, keep a very accurate record of every barrel that the independent refiners put into each city, town, and hamlet. Their traveling men have to report each night concerning the customers in every town, whether or not they are their customers, whether they buy oil, and if not, why not, and whether or not there is any independent oil there. They keep closely in touch with the business. That is one reason why they are such a success, because they know what we are doing. I have found severe competition at times, so severe, indeed, that I have been obliged to sell oil under cost to certain customers. That is, after a customer has proved to me that he is an established customer, it is certainly to my advantage to endeavor to protect him just as long as I can. We are very cautious, however, about that, because we have so many times finally lost customers whom we have protected for six months or a year. They turn us down, and the Standard makes some arrangement for the handling of their oil. I have in mind such a case at Peekskill, N. Y., which took place within the last year. We had such a case as that at Albany some eight years ago. I am thankful to say those cases are not in the majority, because we endeavor to use our customers so that at times of pressure they will stand part of the loss and we stand part. We can hold, perhaps, a majority of the trade. I have letters here which I could read you regarding the severe competition that exists in different parts of the State of New York and the west.

I would further state that my company has two agencies, one at Auburn, N. Y., and one in Syracuse, N. Y. The prevailing price for 150 water-white oil in Syracuse during the past winter and early fall was 7½ cents per gallon. The prevailing price for the same grade of oil in Auburn, 25 miles south, was about 2 cents less per gallon. If you would ask me the reason, of course I could not tell you. It is simply theoretical. I have demonstrated this, however, to my satisfaction, if not to yours, that if I sell a limited amount of oil, very limited, say a tenth of the consumption in Syracuse, there are nine chances in ten that the prices will not be cut. But it is different if I attempt to get one-third or one-half of the trade, as I did in Auburn. I wish to state, however, that the people who owned the distributing concern in Auburn had received this cut before I took hold of the business. It is to my interest to distribute my business, and I find it better not to attempt to compete in that way. With some customers, where I am not marketing by the tank wagon system, as I do in country towns and other places, I have a very heavy competition at times, which might be called an unjust, illegal competition.

Q. Is it your general policy not to attempt to drive the Standard out of any of its markets, but rather to get into some markets and secure only a small per cent of the trade, but not enough so that they will think it worth while to cut prices against you, and in that way to make your profits A. That has been my method during the last five or ten years.

Q. (By Senator Mallory.) What were you going to say was the reason for the difference in price between Syracuse and Auburn? A. The reason, which, perhaps, I did not make plain, was that I was selling a larger percentage of the consumption of oil in Auburn than I was in Syracuse.

Q. If you pass a certain limit then they cut? A. What that limit is I do not know. I have established it in my own mind. Were I to go to Albany today and establish a tank wagon system, there is

no doubt that for the first few weeks there would be a cut in prices; but if with the first advance of the market I maintained a sort of half-normal condition and desired simply to put out enough oil to pay running expenses and make a small profit, the probabilities are that prices would be maintained at an advance in time.

A CUT IN REAL ESTATE PRECIPITATED.

Q. Has that been your experience to such an extent that you can put it down as a rule to be governed by in your business? A. No; there are no rules in the oil business. I wish to state, however, that sometimes even one barrel of oil will precipitate a cut by the Standard Oil Company. A friend of mine shipped simply one barrel of independent oil with an independent brand on it to Salisbury, Md., (I believe it was Salisbury). He sent it there as a present. A friend had told him that they were getting very poor oil there. The oil arrived, and the party to whom it was shipped, being a consumer and not a retailer, and having just bought a barrel of oil and put it on tap, in order to get rid of the barrel of oil presented him sold it to a darky, who put it on his wagon.

Q. (By Mr. Jenks.) You mean the oil of good quality? A. Yes; the good quality; the independent oil. The darky put it on his wagon and went peddling it through the town with the brand on the barrel. The Standard Oil Company at once began to investigate. Then they shipped in a carload of the best oil, the citizens said, that ever arrived in Salisbury, and made a heavy cut on the price of the oil; but, of course, there was no fight. The oil was not sent there to compete with the Standard Oil Company, but they are very alert; they will know unquestionably tomorrow morning what all my shipments were today. They know in New York city where the oil is billed to. They may not get it at the Titusville freight office, but if not there, they get it at the junction points, either Buffalo or one of the others. We know that because our customers have been apprised of the fact by some Standard traveling agent who has approached them and said, "We understand there is a car of oil on the way for you from Titusville." The customer does not know it is on the way. He knows he has ordered it, but he has not yet received the invoice. So you see our business is entirely given away by some one. I can not say positively it is the railroad companies. It is not the men in my office, because all the men in my own office are members of the firm.

EXAMPLES OF COMPETITION.

Q. Can you give one or two specimen cases of the competition that you have in mind? A. You understand, now, that is simply my side, or rather my customers' side of this business. I have not evidence here, nor in my possession, that the Standard Oil Company, or their agent, said this. I believe, however, that he did say it. This letter is from Shortsville, N. Y.; it is one of my customers, Thomas & Harrington [reading]:

[Office of Thomas & Harrington, dealers in fine groceries, dry goods, boots, and shoes.]

Shortsville, N. Y., March 23, 1876.

T. B. Westgate, Esq.

Dear Sir: We take this opportunity of writing you to explain the situation in the oil business. Mr. Cady is here, and we told him just how things are. One of the merchants here wrote a letter to Buffalo in answer to an inquiry from the Standard people asking why there was not more Standard oil sold here. His letter was sent to New York, and they telegraphed to Buffalo to send a man to Shortsville at once. Their agent came and went to Mr. Hall, whom we supply with oil, and tried to get him to take some in the carload, but he refused, saying he could buy of us, and the agent made the following reply: "We have tried to treat Thomas & Harrington right, and have offered them oil less than they can buy elsewhere, but they still refuse; now we are going to force them to buy of us." The next day they cut the oil to 7 cents. We have held the price up to 10 cents, but our trade is leaving us and we must meet them. Now, under the circumstances, what is the very lowest price you can put in a carload of diamond oil for? Answer at once.

Yours, respectfully,

THOMAS & HARRINGTON.

The oil supplied to Mr. Hall was American Refinery oil—my oil.

Q. (By Mr. Farquhar.) Did you furnish them oil at a rate so that they could compete with the Standard Oil Company? A. Yes; I furnished them oil so they would not lose money, but there was no profit in it.

Q. (By Mr. Kennedy.) No profit for you? A. I can not tell you what price I got for it. I think it was one-fourth. We figured that we could give him from one-fourth to three-eighths of a cent a gallon on our oil. We are doing a fair business there—all the Standard Oil Company will let us do—and customers find that we can not cut prices from half a cent to a cent a gallon and be able to stand it without a loss. The fact that we can run on such small margins is due to the magnitude—the great volume—of the business.

Q. (By Mr. Jenks.) If, under the pressure of competition, you make a cut of three-eighths of a cent a gallon, are you taking all your profit away? A. Yes.

Q. And your ordinary margin? A. I wish you to understand this, however. We will say that the price of crude oil is three cents per gallon, and refining is one-half a cent a gallon. You would say, then, not being acquainted with the business, that if I sold water-white oil at four cents per gallon I would be making one-half a cent per gallon profit. You must take into consideration that there is a waste of from 5 to 7 per cent in refining; there are products, such as tar, that today is worth about

2½ cents per gallon. Tar has been as low as three-fourths of a cent per gallon. In figuring the prices of the high grade goods, therefore, we must not forget that there are low grade goods of very inferior value, selling at even less than the price of crude oil. Benzine a year ago was less than crude oil; today it is worth more than water-white oil, being the most valuable product we have; that is, in the illuminating oil business—not in the lubricating oil business. You see, then, that we have to take all of these things into account. In Fulton, N. Y., we have a customer by the name of W. S. Crandall. He is simply a retail peddler of oil, perhaps worth a few hundred dollars. He has been my customer for five years. He wrote me on April 7 the following: "The Standard Oil Company has put another retail peddler on the road. There was already one here, and this makes two retail peddlers they have here now drumming the trade. They have had one here for a year. He came April 1, 1898; about three weeks ago he approached my man and wanted to hire him, and offered him considerable more than I would pay him and a bonus of $100 if he would go to work for him. He would give him a bond, with a contract to keep him employed for ten years; but he could make no impression on him, for he would not leave me. Now they have hired another man, and both the retailers and the man that wholesales are telling the people that they have a carload of American oil on the road that will soon arrive, and that they will be prepared to furnish the same oil at less than we are selling it." I should have said, previously to this, that the Standard has repeatedly tried hard to get this man away from me. Of course that is all right; there is no harm in that. If they can give him good goods in a general way on a margin of profit, that is straight business. Ten days after receiving this letter, May 26, I received another from Mr. Crandall, which I do not need to read, but he stated in that that a carload of oil—our oil—had been received by the Standard agents in Fulton and wanted to know if we had shipped it to them, and told me about what the qualities of the two grades of oil were. I immediately reported that we had not shipped a carload of oil to Fulton to the Standard Oil Company or any one else but himself. I asked him to get the date of the inspection on the gallon end of the barrel, and that would give me a way of finding out to whom I shipped that identical oil. He did that on May 26, and wrote me that he looked at the barrels and found that they were inspected by my inspector on April 2. The only carload of oil that I shipped out on April 2 in barrels was to the Merchants' Refining Company in Buffalo. I shipped it in a Western New York and Pennsylvania box car. Now, I am not prepared to say, gentlemen, that that identical oil in those barrels was my oil. They might have taken my oil out and put their own in at Buffalo, but in all probability they would not do that, because it is an expensive business. It probably was my oil. I know very little of the Merchants' Refining Company. They are a small company, and I understand that they buy Standard goods. I did not know that at the time I sold this carload of oil to them; but that is the method they adopt to get the American Oil Works oil in there to compete with my man. They could not do it with their own goods. We certainly had one man in Fulton, N. Y., who had the spirit of our forefathers.

Q. What has been the effect? A. He says in another letter that the other man follows him around and endeavors to get the trade by fair means or otherwise. They offer to cut the price from one cent to four cents a gallon, and to give them what they claim is the same oil my customer is dealing out to the people of Fulton.

Q. Do you think their intention is to drive your man out, if possible, by selling your oil cheaper than he can sell it, and then afterwards put in their own? A. And drive him out of the business?

Q. Yes. A. In this particular case his consumption is so small that it is not myself that I care so much about as I do about him. Besides, it would establish a precedent which would keep him or other men from undertaking the same line of business in other places. The cancelling of six or eight cars a year that this man handles would have very little effect on my business, it simply affects him.

COMPETITION ON THE PACIFIC COAST.

Now, these letters that I have read and this evidence I have given is hearsay, and in a court of justice might not be admissible. I have, however, a letter from Portland, Ore., which I will give in evidence, which is to my mind evidence of the most flagrant violation of honest competition that I have met with. That is on paper. They are very cautious usually about what they do in the way of making threats. This letter is, as you see, from the Standard Oil Company, Portland agency, George C. Flanders, special agent, Portland, Ore. This letter is written to a firm in South Bend, Wash. I perhaps had better state now that I have been shipping oil in barrels from Titusville to a Mr. Copenspire, in South Bend, and that he had been selling a few carloads of oil in South Bend. It seems that Eichnor Brothers, of South Bend, had written a letter to the Standard Oil Company at Portland, Ore., describing the condition of the oil business there, in reply to which the Standard Oil Company, over the signature of Mr. George C. Flanders, special agent, wrote as follows [reading]:

Portland, Ore., March 28, 1894.

Eichnor Brothers, South Bend, Wash.

Gentlemen: Your favor of the 24th instant, giving information regarding Sun Light oil duly received and contents carefully noted. It seems that the consumers of coal oil in South Bend have a curious idea as to what kind of an oil constitutes a first-class burning oil. We will state for your information that never a drop of oil has reached South Bend of a better quality than what we have always shipped into that territory. They can name it "Sun Light," "Moon Light," or "Star Light;" it

makes no difference. You can rest assured that if another carload of "Sun Light" oil arrives at your place it will be sold very cheap. We do not propose to allow another carload to come into that territory, unless it comes and is put on the market at one-half its actual cost. You can convey this idea to the young man who imported the carload of "Sun Light" oil. Thanking you kindly for this information, as well as past favors, we remain,

Yours truly,

STANDARD OIL COMPANY.

By Geo. C. Flanders.

Q. (By Mr. Jenks.) Have you any other information to give with reference to their methods of competing? A. I think of one method of meeting this which one of my customers in the east tried some seven or eight years ago. He was a German. He had good Bismarck blood in him, I judge, from what I will recite to you. I had sold him a number of carloads of oil, and the Standard agent of Jersey City came to him and said, "We must sell you the oil that you are jobbing here in Hoboken." He said, "No; I prefer to buy independent oil." The agent said, "We will name you a low price, and we will fix a marketing price so that you will make a good thing out of it." He said,"No; I prefer to run as I am running." The Standard agent then said, "If you continue in this, we will so cut the price here that we will drive you out of the business." He said, "You mean to make me lose all the money that I have made?" The agent replied, "Yes." He said, "If you will do that, do you know what I would do to you?" And continued, "I would go over to your warehouses and I would blow them up with dynamite; that is what I would do." He told me that in less than three days the Standard Oil agent was over to see him and a price was fixed; but he still continued to handle oil from my refinery.

Q. That is, by an agreement between the Standard Oil Company's agent and himself? A. Yes.

Q. Is your source of information the man himself? A. Yes; his own mouth.

Q. Have you finished with this special point? A. Yes.

Q. (By Mr. Farquhar.) I would suggest that the name of this man be given. A. Charles Frey.

Q. (By Mr. Jenks.) Was it at Hoboken or Jersey City? A. He was at Hoboken, and the Standard Oil agent was from Jersey City.

Q. Does this cover substantially what you have to say with reference to methods of competition, aside from the question of freight rates, that might come up? A. I think what I have stated is sufficient.

Q. (By Mr. Jenks.) You have had other experiences of somewhat similar nature, I suppose, but these are typical ones? A. Yes.

PURCHASING AND DISMANTELING INDEPENDENT REFINERIES.

Q. Do you know whether the Standard Oil Company, for the purpose of getting control of prices in certain sections of the country, has bought up competing oil refineries and then dismantled them? A. Yes; it has.

Q. What special instance have you in mind? A. Two large refineries in Titusville were bought up in the year 1895 by the Standard Oil Company, not simply to get the refineries, but to get the stock which they held in the United States Pipe Line and the Producers' and Refiners Oil Company, Limited. They wished to assume or get control of these pipe lines; they did not care a snap for the refineries. They made that statement. They made a proposition to all of us to buy out all of the refineries if we would put our pipe line stock in; and three of the largest refineries sold, two in Titusville, the Union Refining Company and the International Oil Company, Limited, and S. Y. Ramage, of Reno. You may ask, perhaps, if that did not lessen our own competition, those being drawn off and the refineries dismantled. The Standard dismantled them, and the iron was mostly sold for junk. It did, certainly, give us that much more field—that which these special independents had been working in; but in did not give their patronage to the United States Pipe Line and the Producers and Refiners' Oil Company, Limited, who needed it; it took it away. At that time we were having a very crucial test in the refining business and pipe lining. It did not give us the patronage which we, as pipe line men, desired and needed. It costs comparatively little more to run 100,000 barrels of oil a month through a crude pipe line than it does 75,000 or 60,000. It is always best to run full volume, and it took away not only their patronage, but their influence in our independent enterprises.

Q. (By Mr. Phillips.) Were they buying crude oil through those independent lines and also shipping refined? A. They were.

Q. Those refining companies? A. They were three of our largest refineries.

Q. (By Mr. Jenks.) So, as a matter of fact, the business of the independents was seriously damaged by these three refineries selling out to the Standard Oil Company? A. Yes; it was.

Q. Have you any information with reference to the prices that were paid for those refineries? A. I have not.

Q. What were the offers that were made to you? Were they what you would consider high under ordinary circumstances? A. The offer did not come to me in person from the Standard Oil Company, but through those who did sell and who had been in direct communication with the Standard people in New York. The price was not high; it was simply a constructive price—a cost price.

Q. That was all there was to it? A. That was all I was offered for my plant.

Q. Have you any knowledge with reference to trans-

actions on the part of the Standard Oil Company at any other time in the way of buying up refineries and dismantling them to get rid of competition? A. I know from hearsay, before my oil days, that such things were done to quite an extent. I have no personal, direct knowledge.

Q. Your own knowledge is practically limited to this experience in Titusville? A. Yes.

EFFECT OF THE STANDARD OIL COMPANY ON PRICES.

Q. Some other witnesses have spoken with reference to prices and the effect of the Standard Oil Company on prices. This chart, representing prices of crude and refined petroleum, shows the way the prices of petroleum have fallen. Will you tell us what, in your judgment, are the reasons for the decline in price of refined oil, as compared with the price of crude oil, since 1870? A. In the early days of refining, the by-products—what we term by-products, such as benzine, from which gasoline is made, and tar—were entirely worthless. They were either run into the creek at night or run into holes dug in the ground and burned. Their value then as a fuel was not realized, and refiners were buying coal and wood to refine oil with, when they were running into the creek what they might have used for fuel. I might say that the percentage that we now take out in these products—I do not know what they took, but it was practically about the same—is something like 20 per cent. of the crude product. About one-fifth of the crude oil product was entirely wasted, which to-day, in 1899, is worth a high price; for instance, benzine is worth more to-day than water-white oil, as I have already stated, and tar is worth nearly as much as crude oil. These prices fluctuate; tar has been worth 4 cents a gallon during the past eight years, but it has been down as low as three-fourths of a cent a gallon.

Q. So that in this way about 20 per cent. of the crude oil, which formerly was an absolute loss, is now saved and made as valuable, on the average, perhaps, as the refined oil itself? A. Yes. Then, too, the cost of refining has lessened very much. Approximately, oil can be refined for one-half cent per gallon—I refer now to illuminating oil and gasoline—whereas I am told that in the early days it cost about 2½ cents a gallon. The quotations which have been placed before you were based upon refined oil at the seaboard in 1898; that is to say, oil in barrels. In 1898 refined oil barrels were worth, in Titusville, 88 cents apiece. In the early days barrels were worth from $2 to $3, which makes a difference of from 2 to 4 cents per gallon in the value of a barrel, which would knock off considerable of this advance in price, as he has arranged his schedule.

Q. As a matter of fact, when we find oil quoted by the barrel, the value of the barrel is included in the quotation? A. Yes; the schedule is right, no doubt; but if the logic the witness uses is right, why should the Standard make the price of refined oil in 1895, when crude oil was $1.35 a barrel, 4.9 cents per gallon, and in 1898, when crude oil was only 90 cents a barrel, 5.7 cents per gallon? You see, there is a difference there of 80 points. If they are cheapening, if they are tending to lower the price, his table is all right, but I do not see the logic in the point that he makes. These prices are simply on export oil. Suppose we take last year's average price. Refined oil was 5.7 cents per gallon; if for some reason the Standard Oil Company sees in foreign countries a necessity for cutting the price of export oil 1 cent a gallon, making it 4.7 cents per gallon, they would simply have to advance the prices on home products 1 cent a gallon on the balance of the products to make up for that deficiency, and therefore you cannot determine prices in the oil business generally upon the prices of export oil alone. If his logic is true, he is giving all the benefit to the foreigner, because these prices he uses for the chart basis are on export oil; there is very little export oil used in the United States, supposedly. If his logic is true, he is helping the man over on the other side, and you and I have to pay higher prices for water-white, lubricants, and gasoline. Do you see the point I make?

PRICE OF EXPORT OIL NOT A CRITERION OF PRICES IN THIS COUNTRY.

Q. Do you mean that he uses figures which simply represent one quality usually sent abroad, and that the table therefore does not represent the average price of refined oil to the consumers or the wholesale dealers in this country? A. Yes; this is export oil and represents about 44 per cent. About 44 per cent. of the crude product is export oil.

Q. Your general conclusion, then, is that the figures cited in this table, or represented on the chart, are untrustworthy for the purpose of drawing any conclusion as to the general level of prices to the consumer or to the wholesale dealer in this country? A. That is certainly my conclusion. I believe, however, that the Standard Oil Company is employing the very best brains engaged in the manufacture of oil. They have certainly brought forward a great many inventions in the refining of crude petroleum. I certainly believe that. A man cannot help but see that they are improving every day. They are doing a great deal to bring out the very best there is in crude oil and make the most of it. That is their business. They probably do more than any man or any firm. Probably Mr. Van Sickle, who was an independent refiner in the sixties and seventies, brought forth more original ideas at that time that are still being used than any one refiner. He was a very practical man.

Q. You would be inclined to think, then, that on the whole this decline in prices that has come through improvements in methods of production is due, in part, to the work of the Standard Oil Company and in part to the inventions of the independent refiners, and that the honors might fairly be distributed between the two? A. You must not forget that with this decline in the prices of refined oil there has been a very heavy decline in crude oil; wells are bored and handled so much more cheaply. Originally one man with one pump, boiler and engine would pump one well; to-day little wells doing a half or quarter of a barrel are harnessed up to one big drive power, with 20 and 30, and even 40 other wells. So you see the expense of operating is

so greatly reduced that the cost of producing has become nominal compared with what it was 10 or 20 or 30 years ago.

Q. At the same time, in accordance with this table, the price of crude oil has not declined materially since 1879. In that year it was selling at 88 cents a barrel. Was it not $1.05 in 1895? A. What is it now?

Q. So the price of crude oil, on the whole, seems not to have declined very much since 1879 and 1880, and of course the price of refined has also declined very much less since 1880 than it did between 1870 and 1880, according to this chart. Would it be right, then, in your judgment, for us to infer that the chief improvements in the methods of production were made between 1870 and 1880 rather than since 1880—improvements in the methods of refining? A. Between what years?

Q. Between 1870 and 1880, I will say, instead of since 1880? A. That would be simply speculative.

Q. It was during those years that the chief difference was made in the cost of the refined product. (No response.)

Q. (By Mr. Phillips.) Have the Standard people any superior methods of refining that are not known to the independents? A. If they have, we do not know it. Of course, if we did know it we would use the same; they do not give out their information, certainly not.

Q. Do you believe you can get out the whole value and make as good oil as they, both in by-products and refined material? A. I believe the independents put out as good goods in every way as the Standard Oil Company does, certainly.

FREIGHT RATES AND TRANSPORTATION.

Q. And as economically in proportion to the amount they put out? A. I believe we do; yes.

Q. (By Mr. Jenks.) The question of freight rates and the apparent advantage of the Standard Oil Company in that respect has come up a number of times. Have you any information that you can give us concerning the freight rates that you secure, and the influence of the Standard Oil Company upon the railroads, or the special advantages they get in the way of freight rates? A. With reference to oil rates, I have no reason to state that we are paying any higher rates per hundred than the Standard Oil Company is. They are not shipping anything from Titusville, but there are other given points, such as Olean and Buffalo. Buffalo would take a little higher rate, however; but I know that they are underbilling their cars. Since the establishment of the Interstate Commerce Commission the railroads, I think, have been very careful about giving rebates on oil, or perhaps on any other traffic; they may do it; I know nothing of the kind.

UNDERBILLING OF CARS.

But I have seen freight receipts in New York from one of my former customers wherein a car of 7,000 to 7,200 gallons was billed from Olean at 24,000 pounds. Now, that car weighs, according to the basis on which we have to figure, 6.4 pounds per gallon—from 44,800 to 46,080 pounds. I give you the weight of 7,000-gallon tank cars of oil. Were I to bill that car or those cars I would have to bill it as I have stated, at actual weight—44,800 or 46,080 pounds. They also prepay their freight. Perhaps I should not say that, for I do not know it; but my customers, who have received oil from them, state that the Standard prepays all freight on oil, and I believe they do. They have been paying the same freight rate per hundred, but you see what a disadvantage I am working under if I have to bill 44,800 pounds where they can bill it at 24,000 pounds and get it through. I have seen three of these freight receipts, and my opinion is that every car that goes out of Olean, or any other of their refineries, is billed on this same basis; and I believe that is where they are getting the remarkable leverage; and I believe, also, if I were paying on the same basis as they are, or they were put on the same I am, we would not have to make such cuts or else go out of the town.

Q. Why not bill at still less than that? A. Twenty-four thousand is the minimum capacity, the minimum car weight in billing oil.

Q. Then you believe it to be true that the general custom that is followed is to bill every car at the minimum weight, although the car itself may be very much larger and heavier? A. Yes; at the minimum weight. I know one other incident. It is just hearsay, but the case of these receipts only confirms what I am about to say. A certain party in New York bought a few tank cars of crude oil from the Standard Oil Company, which were shipped from Olean. The cars arrived and the freight bills were presented for collection, because they were buying it f. o. b.; they bought it f. o. b. Olean; it was certificate oil put into tank cars; it was not refined; the freight bills were presented to the buyer, who noticed, to his surprise, that the cars were billed at 24,000 pounds; and the cars held from 6,000 to 6,600 gallons, which would be 38,400 pounds on a 6,000-gallon tank.

Q. (By Mr. Phillips.) Of difference? A. No; that is what I would have to pay; they were billed at 24,000 pounds, whereas they actually weighed 38,000 pounds and more. A few days later this buyer got a corrected bill from the railroad company billing them at actual weight with the regular rate, which he paid, of course. I do not believe these were errors. The three cars I speak of in central New York were not billed at the same time; they were billed at different times, and those things could not be errors. Every railroad has or should have what we call a tank-car book, giving the number and initial of all the tank cars in the United States and Canada, with the gallonage and the weight, figured at 6.4 pounds per gallon.

Q. (By Mr. Ratchford.) Six and four-tenths per gallon? A. Yes, per gallon; 6.4 pounds per gallon. Therefore, I say, these things cannot be errors on the part of the billing clerk. It only confirms my belief. It is my belief, of course, that they are getting their goods put through, when in tank cars, at 24,000 pounds, while I am paying on the same car for practically 50 or 100 per cent. more than the weight for which they are paying.

Q. (By Mr. Jenks.) Do you recall the dates of these receipts? How long ago was this? You say you have seen separate receipts; have you any idea about when that oil was shipped? A. It was about three years ago.

Q. So you think that, within four years at any rate, you have located three specific cases in which the Standard Oil Company has had its oil underbilled, i. e., at 24,000 pounds, where a fair billing would have been at least 44,000 pounds, and probably more? A. Yes.

RAILROADS DO NOT CARE TO HANDLE INDEPENDENT OIL.

Q. Have you other information with reference to freight rates in connection with the oil business? A. In reading these two letters I wish to show to the commission that for some reason independent oil is not a commodity that the railroads are desirous of handling. This one is from the commercial freight agent of the New York, Chicago & St. Louis Railroad Company; he is in Pittsburg. He writes (reading):

Pittsburg, Pa., April 12, 1898.

Subject: Rates on oil, Titusville to Vermont points.

Mr. T. B. Westgate,
Manager American Oil Works,
Titusville, Pa.

Dear Sir: In referring to conversation the writer had with you a short time ago in regard to rates on oil from Titusville to points in Vermont—

I regret exceedingly that at the present time we cannot name satisfactory rates on oil from Titusville to Vermont points.

We hope, however, to be able to do so in the near future and will advise you just as soon as possible.

Yours, truly, W. H. RICHARDS,
Commercial Agent.
HOWES.

Here is a letter from the New York Central Fast Freight Line, F. L. Pomeroy, general manager, Buffalo. He is the general manager of the Red Line, White Line, Blue Line, Canada Southern Line, and Midland Line (reading):

Buffalo, N. Y., December 5, 1898.

Messrs. American Oil Works, Limited,
Titusville, Pa.

Gentlemen: I have your favor of the 25th instant asking for rates on oil in tank cars and barrels from Titusville to Montreal, province of Quebec, and in reply would say that oil is not a commodity that we are permitted to handle by our fast-freight lines; therefore I have no authority to make or discuss rates on this commodity, but would refer you to Mr. S. Goodman, assistant traffic manager, New York Central & Hudson River Railroad, New York City.

Thanking you for the business which you are giving us of other kinds, which is fully appreciated, I am,

Yours, truly, F. L. POMEROY,
General Manager.

FREIGHT RATES ACCORDING TO THE RED-LINE TARIFF BOOK.

I wish to offer in evidence a Red Line tariff book. The Red Line is one of the lines of which Mr. Pomeroy is general manager. I take it that these lines are a sort of wheel within a wheel for some purposes. I am now billing oil at Titusville to certain points via the Red Line. This, as you men who are acquainted with the railroads understand, gives in alphabetical order the names of towns in Pennsylvania, New York and the Eastern States and their freight rates; that is, it gives what rate it takes; for instance, Abbington, Mass., takes a Boston rate. Referring to the sheet that this D. A. V. M. Line provides me with, I find the Boston rate on oil in carloads is 23½ cents per hundred; in less than carloads, local, it is 33 cents a hundred. I am prohibited shipping carloads to certain points named in this; that is, carloads of oil. Other classified freight goes through and oil in local lots goes to some points; but to points on the New York, New Haven & Hartford (e. g., the first one I read, Abbington, Mass.), I could not ship oil unless I paid 33 cents. I would have to pay an arbitrary price. This occurred, I should say, about three years ago, when the New York, New Haven & Hartford came into certain hands. We suppose it is controlled by the Standard Oil Company. Our territory is being narrowed each year by the roads which are in some way made servants, in my opinion, of the Standard Oil Company.

Q. If I understand you, this Red-Line rate book that you have shows that you can ship ordinary kinds of freight at Boston rates to all these local points. A. Yes.

Q. When you yourself attempt to get rates do they simply say they will not quote you any rate at all for carload lots of your product? A. I enjoy freight rates to some of these points. There are exceptions; for instance (reading): "Agents take special notice: Petroleum oils to points via Syracuse, on the Ogdensburg & Lake Champlain Division of the Central Vermont Railroad and points beyond, cannot be taken at rates named in this tariff. Shipments of petroleum oil destined to points on the New York, New Haven & Hartford Railroad (New Haven and Old Colony systems) cannot be taken at rates named in this tariff. Such shipments will be subject to arbitrary rates from the various junction points of the Boston & Albany Railroad." Now to points like Malone, which, on other freight, take a Boston rate, on oil of 23½ cents a hundred, I am compelled to pay 26½ cents per hundred. As I go beyond Malone to Rouse Point, I am obliged to pay 33 cents per hundred.

Q. Although through freight, ordinary freight will be sent for 23½ cents? A. First-class freight is 20 cents per hundred. Oil is listed a little higher than fifth-class. I can ship anything to most any of these points specified unless it is designated here as arbitrary.

Q. (By Mr. Phillips.) Why, in your opinion, did they make that difference—prohibit shipping to some points and allow Boston rates to others? A To keep us out of that territory.

Q. Would the difference be so great as to consume your profits largely? A. It, in some instances, prevents us from selling in those localities and causes the consumer to pay a higher price for his goods, because the Standard probably will sell a little bit under us, getting the benefit of the high freight rate which I have to pay from Titusville and which they do not have to pay from, say, a New York point north or a distributing point somewhere, such as Albany. I wish to show in connection with these, which I term exorbitant freight rates, that this Red-Line traffic book quotes a Boston rate to Adirondack Junction, on the St. Lawrence & Adirondack Railway, which is within nine miles of Montreal. Now, if I could ship oil there, as I should, on the Boston rate, which is 23½ cents, I could make good, fair profit; but I hold in my hand a telegram from Samuel Goodman—I believe he is the assistant traffic manager of the New York Central—in reply to a telegram, which reads as follows:

"5, 6, 1899. To American Oil Works: There are no through rates on oil, Titusville to Montreal, or for other points you name. Tariff from Buffalo to Montreal, Adirondack Junction, Beauharnois is 35 cents per 100 pounds via Utica, M. and M., St. L. & A. C. P., or I. Grand Trunk.

"S. GOODMAN."

He says that he quotes me a 35-cent per hundred rate from Buffalo to Adirondack Junction. That was the point named in the Red-Line traffic book, to which I should get through from Titusville on 23½ cents a hundred, if taking a Boston rate, which is named here; but instead he quotes me 35 cents a hundred from Buffalo there. Added to that, my 8 cents per hundred from Titusville to Buffalo makes a 43½-cent rate per hundred from Titusville to Adirondack Junction. I figured that out in miles and in ton rates. I will give the distance from Buffalo to Utica as 201 miles and from Utica to Adirondack Junction as 223 miles, making a total of 424 miles; the freight at 25 cents per hundred on oil would be $7 per ton, which would be $0.0165 per ton per mile. Now, the New York Central's average receipt per ton per mile on oil in 1890 was $0.0073; in 1889, $0.00712, in 1888, $0.00557; the rate he quoted me is nearly three times the average receipt per ton per mile as given in their schedule in 1890, 1889, and 1888. This computation is on page 100 of a pamphlet containing a case in the circuit court of the United States for the western district of Pennsylvania, which I can give you. This was the testimony that I referred to that was brought before the Interstate Commerce Commission in 1888 in Titusville. The State of Vermont is the State where I have had the most trouble in marketing goods, and I wish to read a letter here from a division freight agent; he is a soliciting freight agent for the Lake Shore & Michigan Southern Railway Company (reading):

Cleveland, O., April 2, 1895.

The American Oil Works,
Titusville, Pa.

Gentlemen: Referring to our conversation of some time since relating to carload rates to Vermont points, I have looked into this matter very carefully and find that the following rates are the best at the present time:

Burlington, Vt., 44½ cents per 100 pounds, via Rutland.

St. Albans, Vt., 50½ cents per 100 pounds, via Rutland.

Richford, Vt., 54½ cents per 100 pounds, via Malone.

St. Johnsbury, Vt., 36½ cents per 100 pounds, via Bellows Falls.

Newport, Vt., 38½ cents per 100 pounds, via Bellows Falls.

The less than carload rate to St. Johnsbury, Vt., and Newport, Vt., is 33 cents per 100 pounds.

Note the attached letter we have from Mt. Chittenden, of the Central Vermont Railway.

Yours, truly, W. F. ANDREWS,
Soliciting Agent.

Return the letter.

I wish to state here that St. Johnsbury and Newport, Vt., are booked in this Red-Line traffic book as taking Boston rates. They should therefore give me a rate of 23½ cents per hundred on oil to those points. This is not the Red Line, however, but the Red Line prorates with the Lake Shore. I think all work together for good except in the oil business. He does not name that to me; he has not named it. Maybe he knows that the less than carload rate in the Red Line book is 33 cents a hundred, but for some reason or other he cannot name me rates on carload lots into those points excepting as I have given them to you. You see that debars us. Such outlandish rates debar a manufacturer from going into territory where they want a good grade of oil, a light oil. Vermont is a good oil State; that is, for selling oil; and it curtails the business.

Q. (By Mr. Jenks.) You think that the Standard Oil Company simply comes into that territory from other shipping points where the rates are very much more favorable A. It must be. They certainly are not paying such rates. They do not countenance any such thing as that.

FREIGHT RATES TO THE PACIFIC COAST.

While speaking of freight rates I wish to mention that a few years ago we enjoyed to the Western coast —Western terminals—a freight rate on oil in carloads of 78½ cents per 100 pounds.

Q. You mean to the Pacific coast? A. Yes; the Pacific coast; what they call terminal points on the Pacific coast. After the establishment of the Standard's refinery at Whiting, near Chicago, the freight rates from Titusville, Oil City, Warren and Pittsburg to those points on the Pacific coast were abrogated, and they would not give us a through rate, but we

must bill to Chicago at 17½ cents per 100 pounds, and then from Chicago west we added 78½ cents per 100 pounds.

Q. So that before the establishment of this refinery you had a rate to the Pacific coast, at terminal points, of 78½ cents, and afterwards your total rate through was 96 cents? A. Yes; that was after the refinery was built near Chicago, at Writing, Ind. I have a letter in my hand from Charles T. Hallowell, general freight agent, Green Line system.

(Letter referred to is as follows):

Oil City, Pa., April 12, 1899.

American Oil Works, Titusville, Pa.

Dear Sirs: On request of Mr. Westgate we made application to Delaware & Hudson for rates to points on that line north of Whitehall, and have only just received Mr. Wadsworth's letter quoting the following rates per hundred from Whitehall, which must be added to our Boston rate of 23½ cents from Titusville:

	Tank Cars	Barrels
	Cents.	*Cents.*
Chubbs Dock, New York	5	4
Dresden	5	4
Putnam	6	5
Wrights	8	7
Delano	9	8
Addison Junction	9	8
Crownpoint	10	8
Port Henry	10	8
Westport	11	9
Wadhams Mills	11	9
Whallenburg	11	9
Essex	11	9
Willsboro	12	10
Port Kent	13	10
Plattsburg	13	10
Beekmantown	13	10
Sciota	14	12
West Chazy	13	10
Chazy	14	12
Coopersville	14	12
Rouse Point	14	12
Mooers Junction	14	12

We have again written Mr. Wadsworth calling his attention to the fact that the rates quoted are about 2½ cents per ton per mile, which is in excess of what other lines would charge for a similar distance, and will advise you if he makes any further concessions.

For points on the branch from Saratoga to Northcreek our Boston rate will apply, as shown in Group 3 of oil circular No. 22.

Yours truly, CHARLES T. HALLOWELL,
General Agent.

We have also called Mr. Wadsworth's attention to the fact that we asked for rates from Schenectady and not Whitehall.

I received a letter written April 19, 1899, from Mr. Hallowell, in which he says that Mr. Wadsworth, the general freight agent, Delaware & Hudson, will not make any concession, so that if we ship oil to those points we must pay the enormous rate of 2½ cents per ton per mile above Whitehall, which, as a railroad man signifies, is an enormous rate, and far beyond what any other road would charge.

(The letter of April 19, 1899, above referred to, is as follows):

Oil City, Pa., April 19, 1899.

American Oil Works, Titusville, Pa.

Gentlemen: As advised you in our letter of the 12th instant, we again wrote the Delaware & Hudson people in regard to rates you had asked for on that road, and now have letter from Mr. Paul Wadsworth, G. F. A., April 17, advising that he can make no better rate than that already named you for points north of Whitehall, and also states that our oil circular rate of 23½ cents per 100 pounds from Titusville cannot apply to points between Saratoga and Northcreek, and those points will take the following arbitrary per 100 pounds additional:

	Tank Cars	Barrels
	Cents.	*Cents.*
Greenfield, N. Y.	6	5
Kings	6	5
South Corinth	7	6
Hadley	9	8
Corinth	8	7
Stonycreek	12	11
Thurman	13	12
The Glen	15	14
Riverside	16	15
Northcreek	18	17

We regret that we have not been able to make better terms with them, but it would appear that it will not be possible to do any better.

Yours, truly, CHAS. T. HALLOWELL,
General Agent.

Q. Do you mean that you are charged 14 cents per hundred more for oil to Whitehall, or to one of these local points you have mentioned, than, in accordance with this Red-Line traffic book, is charged for ordinary freight? A. No; it takes an arbitrary rate.

Q. You simply think the charge is excessive? A. The charge is excessive; and, in fact, we are daily being narrowed down by the railroads. I cannot get to New Haven, or Providence, R. I., with oil on a Boston rate, according to this Red-Line traffic book. This Red-Line traffic book on all other roads takes a Boston rate to Providence and New Haven. What is the cause for it?

CHARACTER OF OIL AS FREIGHT.

Oil is a good freight to handle. Mr. Motheral, who is a confidential man of the Green Line in Oil City, gave statistics in 1888, before the Interstate Commerce Commission, relating to the loss and risk in handling oil by freight, which I will read from Page 189 of the

Pamphlet of testimony taken in cases 153, 154 and 163 before the Interstate Commerce Commission:

"Q. What is your opinion, from your own experience of the business, relative to the risk of fire from the transportation of oil by the two different methods, by tanks and barrels; which is the greatest?

"A. It is greater in tanks.

"Q. How much? What relative portion should you say?

"A. From 1882 to 1887, five years, the loss on oil in barrels was twenty-seven one thousandths of 1 per cent; the loss on oil in tanks was forty-three one thousandths.

"Q. That is the result of actual experience?

"A. That is a statement made up from our office a year or so ago. I looked it up again to-day."

So you see the loss in transportation of oil is almost infinitesimal and my opinion is that, if we could keep about upon the same basis—not my refinery alone, but all refineries and all shippers of oil—as the Standard Oil Company, we should not be having this terrible experience that we have had at times. We could get prices, because they would not have the means to cut us.

Q. (By Senator Mallory.) Can you indicate what basis that is? A. I referred to that a few moments ago when I stated that they were underbilling. I have evidence where they have underbilled—i. e., oil that would weigh 44,000 pounds was billed at 24,000 pounds.

Q. (By Mr. Kennedy.) What did you say the wastage is in piping oil? Did you state that? A. I did not say.

Q. Just the wastage of tanks? A. You mean this railroad?

Q. Yes. A. These figures that I gave concerning the transportation of oil in tank cars are given by Mr. Motheral, probably one of the best-posted traffic men in the country, because the Green Line, up to that time, undoubtedly handled more oil freight than any one road.

Q. Have you any figures there in regard to wastage in pipe lines? A. No. From what I have read and from what my experience has taught me, the railroads do not cater for the independent oil trade. Until within the last two years we had very few railroad men soliciting oil trade; we have very few now; a few local lines solicit; but I do not remember of a New York Central, a Vermont Central, a New York, New Haven & Hartford, or a Boston & Albany man asking me for freight, and I ship in the neighborhood of from 12,000 to 14,000 barrels a month, going in directions that would be over their lines. During the construction of the United States Pipe Line, when we had a few tons of iron to haul to Athens and various points, and it was published in the papers that tanks were to be erected and that pipe was to be laid, there were traveling freight agents after us every day to get the shipment of those goods over their line—Lehigh, Erie, and other ways. We could ship iron, but the oil—we must not handle it. That is probably the password that goes over.

In connection with that Montreal business, I wish to state that we enjoyed, up to last fall, I think it was in October, a 23 cents per hundred rate from Buffalo, to Montreal, P. Q.

Q. (By Mr. Jenks.) Had you been shipping oil to Montreal regularly for some time? A. We had.

Q. For how long? A. Four years and over.

Q. At what rate did you say from Buffalo to Montreal? A. It was 21½ at one time, but it was advanced to 23.

CANADIAN REFINERIES PURCHASED BY STANDARD—ADVANCE IN FREIGHT RATES.

Q. For most of the time it was 23 cents from Buffalo to Montreal? A. Yes; but at the time the Standard Oil Company came into possession, either by purchase or lease, of all the refineries in Canada, at Petrolia and other oil points, the freight rates from Buffalo to Montreal advanced from 23 cents a hundred to 35 cents per 100 pounds. I got caught on that. I was not very sharp. They did not notify me of the advance. I sold a man a car based on the 23-cent rate, and it cost me 35. I was out the 12 cents per hundred.

Q. (By Mr. Phillips.) Did that 12 cents materially affect your prices? A. Twelve cents a hundred is nearly 40 cents a barrel. If I can make 10 or 15 cents a barrel on oil I am doing a good business. It practically cuts me out. I cannot sell oil in Montreal under these conditions. That is why I wired Mr. Goodman to get to Montreal via New York Central, via Utica and Malone, and this Adirondack division, but they did not want the trade.

Q. So you are practically shut off at this time? A. Yes.

Q. Since the Standard made the purchase of the oil fields and oil refineries in Canada? A. Yes.

Q. (By Mr. Jenks.) What are the railroads that made these Canadian rates? A. The Grand Trunk running from Buffalo to Montreal and the Michigan Central prorating with the Canadian Pacific from Buffalo to Montreal.

Q. Then, when you were asking for freight rates around this other way over the New York Central, you were merely looking for another way to get to these same places? A. I did not know but I could find the bars down and slip some oil in; but they put them up.

Q. Then you asked for rates to Adirondack Junction? A. Yes; that is the one I gave in evidence.

Q. That is some distance this side of Montreal? A. Yes; nine miles.

Q. But it was for the purpose of letting you into that Montreal market? A. That was the idea.

Q. Were you going beyond the New York Central line in asking for rates to Adirondack Junction? A. I was not; I could pay a switching charge of nine miles and get it in.

Q. Do these increased freight rates through Canada still continue? How long is it since the rate was put up from 23 to 35 cents? A. I believe it was in October last.

Q. And the rates are still held? A. I understand that the independent oil men in Montreal brought the matter up before the parliament, and that the railroads were either compelled or advised to withdraw that tariff and, according to the paper which

I saw, a Montreal paper, the railroads had withdrawn the tariff—that is, they had withdrawn the printed tariff, but the rate still remained the same, if I wish to ship a carload of oil in there. I think they have some very strong evidence in the matter; but I am not posted. I am not prepared to give it to you.

Q. (By Senator Mallory.) You have not attempted to ship any in there recently? A. Yes; I have a party up there and I have tried to sell, but he could not buy because the rate was too high.

What we shippers would like is this, that oil be classified. To some places we pay more than fifth class, and occasionally a little less than fifth class. If I were asked what class oil should be in, I should say it should be sixth class; but if we had a fifth class rate on oil our Boston rate would be 20 cents per hundred, and we are paying 23½ per hundred. We at one time enjoyed a rate of 78 cents per barrel to Boston, which would be 19½ cents per 100 pounds; but as the web grows tighter the rates go up, and our territory is made smaller.

Q. Is there more risk in the transportation of oil than ordinary merchandise? A. Mr. Motheral stated that the loss of oil in barrels in shipping was twenty-seven thousands of one per cent.

Q. (By Mr. Jenks.) Is it not to be concluded, then, from your testimony, that there is not much more risk connected with the shipping of oil than ordinary merchandise? A. There certainly is more risk.

Q. (By Senator Mallory.) Does that include loss by fire? A. Yes.

Q. But not leakage? A. No; I think the commission should insist upon this commodity being classified. It certainly is of magnitude enough to be classified, and you can see from the evidence I have given that there must be a "nigger in the fence" if we cannot get to certain points in a certain tariff book. We can get to certain points and not to others, and in one case we can get no rate whatever.

Q. (By Mr. Jenks.) Your objection is not so much against high rates as against rates that are not at all uniform to places that seem to be similarly located? A. That is true.

Q. And you also believe that the Standard Oil Company has its goods under-billed, constituting practically a direct discrimination against you? A. That is true.

LITIGATION CONCERNING FREIGHT RATES.

Q. (By Mr. Phillips.) Have you had any litigation with the Standard Oil Company, or any case before the Inter-State Commerce Commission, with regard to freight rates, or discrimination in freight rates? A. Yes; we have. We, the Independent Refiners' Association at Titusville and Oil City, in 1888, had a hearing before the Inter-State Commerce Commission.

We were awarded the claims that we demanded, or asked for. The claims were these: That we should have the same rate per barrel on oil shipped in a package as the Standard Oil Company—i. e., that they were paying on a barrel of oil shipped in tank cars, or that they should quote us a rate per barrel, instead of giving us a rate per 100 pounds. After many days or weeks of session the commission decided in our favor, and awarded us in their best belief, what we asked for. Our awards amounted to something like $88,000. We have been all this time, 11 years, trying to collect this, and we have a case coming up soon in the circuit court of the United States, Western Pennsylvania district, in Pittsburg, bearing on this, which has been decided in our favor two or three times by various courts.

Q. (By Senator Mallory.) What road was that? A. They were the Western New York and Pennsylvania Railroad Company, the New York, Lake Erie and Western Railroad Company, the Delaware and Hudson Canal Company, the Fitchburg Railroad Company, the Boston and Maine Railroad Company and the Lehigh Valley Railroad Company.

Q. Were these companies responsible in the case you speak of? A. They were; yes.

Q. What is the status of that case today? A. The status of that case is a dormant one. They decided we should have this reparation, and also that oil should be shipped per barrel—that is, instead of charging us 400 pounds, as they do now per barrel, it should be taken at 320 pounds, actual weight of the oil, because the tank cars (the Standard Oil Company have their individual cars, and we have a few) are shipped full and come back empty, and also that the empty barrels should be shipped back with no charge, because if the oil was shipped in barrels the cars could be used to load freight back, whereas the tank cars come back empty. But they did not comply with the order given.

Q. The case, as I understand it, has been appealed to the circuit court? A. Yes.

Q. Has it made any progress in the circuit court since it was appealed? A. No, it has not.

Q. Is that what you mean by lying dormant? A. Yes; lying dormant; it comes up this fall.

Q. (By Mr. Phillips.) What court was it tried in before it was appealed to the Inter-State Commerce Commission, if any? A. I have not looked up whether it was a civil action or not.

Q. (By Mr. Jenks.) Do you expect a final decision in the case this fall? A. We do; yes.

Q. (By Senator Mallory.) Can you state in a general way the territory in which you deal? A. Yes; my territory is well defined. It is mostly in the State of New York. I sell some in Vermont, and New Hampshire, and occasionally a car scattered through different States; but that is simply a catch order.

Q. Do you ship to foreign countries at all? A. Not at the present time. The rates are high south.

Q. Do you deal with Cuba at all? A. No.

NUMBER OF INDEPENDENT COMPANIES IN PENNSYLVANIA.

Q. (By Mr. Kennedy.) How many independent refining companies are there in Pennsylvania? A. I should say twelve or fifteen.

Q. Are you connected with one or several of them? A. Simply one.

Q. Have not the independent companies some sort of a combination to protect their interests as against the Standard Oil Company? A. The only association we have ever had was that of the independent refiners of Titusville and of Oil City at the time of this suit, or this hearing. We have common interests in the United States Pipe Line, the Producers and Refiners Pipe Line, and the Pure Oil Company.

Q. That is the only kind of a combination you have? A. Yes.

THE PIPE LINE SYSTEM.

Q. (By Mr. Phillips.) Have you any specific knowledge about pipe line systems, the history of them in Pennsylvania, and the independent pipe lines prior to the organization of the United States Pipe Line and the Producers and Refiners' Pipe Line? A. I have some knowledge, but I think nothing that would be of any special benefit. I could tell you about the time since we organized the Producers and Refiners' Line, of which I am a director. We have had considerable trouble with the Standard Oil Company, who have bought up the production on our line, which caused us to lay lines more remote, but I suppose that is in the course of business. They paid high prices, however, for these properties, and it was a good thing for the individual producer that we were there, because he sold out his property at a very high price. That has been done to quite an extent.

Q. Prior to the organization of the Producers and Refiners Pipe Line Company were you getting your oil through the Standard lines? A. We were buying oil from the Standard.

Q. What pipage did you pay them? A. Twenty cents a barrel.

Q. What are you paying now for getting oil delivered at your refineries? A. We are paying the market price, 15 cents per barrel pipage.

Q. Do you get at this lower rate as good oil as you did when you were getting it from the Standard Oil Company? A. The majority of oil is better. We get poor oil from one district, near Oil City; each refiner has to take his portion; that is inferior oil, black oil.

Q. Does that go through the Producers and Refiners' Pipe Line? A. Yes, it does; about 4,000 barrels a month comes through that line.

Q. What kind of oil did you get through the Standard pipe lines before you owned this line? A. We got oil which was not of as high a grade, not as rich in illuminants as we are getting from the Producers and Refiners' Line.

Q. And paid practically five cents a barrel more for piping than now? A. Yes.

Q. And the oil was not of as good quality? A. No; it was not.

Q. (By Mr. Kennedy.) Can you state what percentage of oil of Pennsylvania is refined by the independent companies? A. I have not the actual figures or data at my command, but I should say about one-tenth.

Q. The Standard Oil Company refines all the rest of it, 90 per cent of it? A. I believe they must have refined it or shipped it abroad.

Q. And the business is profitable, I suppose, to all these independent companies, is it not? A. It has been at times.

COMPETITION WITH THE STANDARD IN FOREIGN COUNTRIES.

Q. (By Mr. Phillips.) Will you state to the commission what method the Standard Oil Company took to circumvent your markets abroad, after the laying of the United States Pipe Line for shipping refined oil through to New York as well as crude? A. The price in our foreign markets, in Germany and Holland, were cut very low, so that we were obliged to sell export oil to one buyer (we have had but the one buyer, Phillip Poth,) very low in fact, at ruinous prices. It was only by the strictest economy that a number of refineries were kept out of the hands of the sheriff during the crucial time we had in 1893 and 1894.

Q. Did Poth handle your oil for a considerable length of time? A. He handled it for a number of years, and until a short time after the Standard Oil Company purchased these other refineries that I spoke of a short time ago. Then I understand that the Standard officials approached him and told him that we were on our last legs and that he had better get his money out of his stuff while he could. They paid him big money for his plant, and it was turned over to the Standard Oil Company entirely; his two sons-in-law were retained in the business. He had promised by all that was true and good to stand by the independent companies. We had sold him refined oil away below the cost of crude oil; but he got frightened when the Standard approached him in this way, and as I say he sold out. The shock was so great that he died within two weeks; we then established the Pure Oil Company—that is, we refiners and producers—and have been marketing our own goods in Germany.

Q .Did they also rent or buy the tankage abroad, so it was very difficult for you to dispose of all your oil? A. They did some of that; yes.

Q. Were you compelled to build tankage and establish stations in Germany? A. We were compelled to do so.

Q. Has your business there been a profitable one? A. Our returns have been very satisfactory in Germany.

Q. What were your profits while Mr. Poth was acting as your agent? A. There was very little in the refining business, just in marketing abroad. We sold him oil f. o. b. New York.

Q. You did not have any profits he made, if he made any, in Germany? A. Certainly not; prices have been good there.

Q. But you sold a good many cut cargoes, did you not? A. Yes.

Q. That is, below cost? A. Below cost, some.

Q. Have you sold any cut cargoes since to your agencies abroad, in the Pure Oil Company? A. No.

Q. They are quite uniform, are they? A. Quite uniform; yes.

RELATION BETWEEN THE STANDARD OIL COMPANY AND THE INDEPENDENT COMPANIES.

Q. A former witness stated before this commission that if the Standard Oil Company were to offer the independent companies a price far beyond the value of their plants they would still refuse to sell out. Is that the feeling of the independent companies of Pennsylvania? Would they not sell for more than the value of their plants if offered that by the Standard Oil Company? A. Now, if you will define that I will answer you directly do you mean $10 more?

Q. There was no specific sum named; it was said they would not sell to the Standard even if offered more than the value of their plants. A. If they were all like him they would not.

Q. Have the Standard people made any attempt to purchase stock or circumvent these independent pipe line companies in any way in order to get control of them? A. Yes; from the suits that have been in progress with John J. Carter and the Producers' Oil Company, Limited, it would seem that is what they are trying to do.

Q. Do you remember the capital stock of that company and how much they purchased? A. The capital stock is $600,000. Mr. Carter originally owned $3,000 worth of stock; he purchased about $300,000 worth more. We believe it was for the Standard Oil Company. I can not testify that it was, but from all outward appearances it looked that way.

Q. Did they attempt to get control of this independent company after purchasing this stock? A. They did. Having the majority of the stock, they expected to elect the managers of the company. But the company, being organized in Pennsylvania under the special act of 1874, called the copartnership law or act, Mr. Carter would have to be voted in by a majority in number and interest in the Producers' Oil Company before he could vote that stock, and our people declined to vote him in. He has been in litigation with the company for the past three years or more, trying to get in. The courts have finally decided—the supreme court—that he was in error, and that the company must buy his stock at the appraised value. The appraiser was appointed, and that appraising has been taking place for the past five or six months. They are arriving at values, as the company are obliged to buy the stock that Mr. Carter owns. He has been voted into a portion of it, I believe.

Q. Have they bought stock in any other company? A. If I remember correctly, they have secured something like $400,000 in the United States Pipe Line.

Q. How much of that stock has been sold, and what is the capital? A. I believe the capital is $2,000,000, and, if I remember rightly, the stock that is out is about $1,200,000.

Q. Did they attempt to get anyone on the board of managers in the United States Company? A. They have one director in the United States Company; yes.

Q. Have they recently been purchasing stock in that company? A. Not to my knowledge.

Q. (By Mr. Kennedy.) That would be a legitimate way of getting control of those companies, would it not? A. Yes; that is one way, but perhaps you or I do not care to go where we are not wanted; that is the only way I look at it; you do not desire to go into a company if you are not wanted there.

Q. If they get control of these companies, do you have any idea they will run them at a profit to the stockholders? A. If they would run it, they would run at a profit; that is the way they run.

TRANSPORTATION SYSTEM THE CAUSE OF EXISTING EVILS

Q. (By Mr. Phillips.) Have you any statement you desire to make that we have not covered by asking questions? A. This question of the aggregation of capital is, of course, a large one for a small man to handle, but I do not fight the Standard Oil Company. It is not my business to fight them. I do not believe the Standard Oil Company, with their millions, could or would drive me out of business, if I had the same advantages (and that every American citizen should have) that they have on the transportation lines. If they do not have that advantage over me, it makes no difference how large the company is; if they are run on right lines, it matters little.

Q. (By Mr. Jenks.) If I understand you, then, the evils that come from the Standard Oil Company would be done away with if the inter-state commerce act could be enforced in both spirit and letter? A. That is what I mean; in short, I mean that oil should be listed as other freight is. And my opinion is that it would be a good idea to have a railroad examiner just as you have a bank examiner for national banks. If I have a grievance and think Jones or the Standard Oil Company is getting cheaper rates from a common point to Montreal than I am, let me file a complaint and have one of these examiners investigate the books of the railroad companies. It takes but a moment to find out where a grocery-man or a wholesale-oil man is buying oil. You are not giving away a man's business by going to a railroad company and ascertaining the freight rate and weight of his oil. The customer is not injured. I say that the complainant should do this because all men are human, and this is such a big business in shipping that we might not get justice even if a commissioner were appointed.

Q. Do you mean by that that it would be possible to buy up an inspector? A. Yes.

Q. Unless the complainant were to have the privilege of going also? A. Certainly. There are so few refineries that three or four railroad exeminers

would, in my mind, be sufficient. Of course other shippers might demand the same thing, but I believe, the way things are, conditions are such that something of that kind is necessary. It strikes me so, because I do not believe that we are getting justice; and I do not believe that we can get it unless a thorough investigation is made.

Q. (By Mr. Phillips.) Do you think there should be laws allowing the inspection of freight passing over the railroads? A. Yes; I do.

Q. Have you anything further to suggest in remedial legislation for monopolies? A. I do not believe they are harmful when on right lines. I believe that illegal or illegitimate competition ought to be banished in some way, whether by legislation I do not know.

Q. (By Mr. Jenks.) By illegitimate competition do you mean special favors shown by railroads, and also this special cutting of rates in particular localities, of which you have already given us examples? A. I mean the cutting of prices below cost of production. The oil business and every other business should be run on its own merits; if the Standard Oil Company, or Armour, or my little works can not get trade by holding out good goods and by good, honest competition, by manly efforts, we are not worthy of the trade; we should certainly have something that will protect us.

Q. (By Mr. Ratchford.) By honest competition do you mean that every man shall be allowed to place his goods upon the market with the opportunity to make a reasonable profit? A. Yes; I do.

Q. (By Senator Mallory.) Do you also mean that public carriers are created for a public benefit, and should not be permitted to show favors to one set of producers as against another set? A. I can write a letter to Montreal, Quebec, soliciting trade, for instance, and send it for two cents. The Standard Oil Company pays two cents for the same kind of a letter. When I ship a carload of oil there that weighs 44,000 or 48,000 pounds, I pay freight on it accordingly; but from what I have seen, from what I have told you gentlemen, I am satisfied that their car goes through billed at 24,000 pounds, although it holds the same quantity as mine does. That is what I want; the majority of companies maintain that that is what I deserve.

AFFIDAVIT.

State of Pennsylvania, County of Venango, ss:

I swear that the statements made by me of my own knowledge in the foregoing report of my testimony before the Industrial Commission are true, and that all other statements I believe to be true.

(Signed) THEODORE B. WESTGATE.

Sworn and subscribed before me this 7th day of October, 1899.

[Seal] Chester L. Kerr,
Notary Public.

Washington, D. C., June 17, 1899.

TESTIMONY OF MR. M. L. LOCKWOOD.

INDEPENDENT OIL PRODUCER.

The commission met at 10.55 a. m., Vice Chairman Phillips presiding. Mr. M. L. Lockwood, being duly sworn as a witness upon the subject of the oil industry, testified.

Q. (By Mr. Jenks.) Will you kindly give us your name and address? A. M. L. Lockwood, Zelienople, Butler county, Pa.

Q. What is your connection with the oil business? A. I am an oil producer.

Q. For how long a time have you been in that business? Since 1865.

Q. Are you an oil refiner also? A. No.

Q. You have, I believe, a statement ready to make to the commission. If you will kindly give us that, we will afterwads ask any questions that seem desirable.

Mr. Chairman and Gentlemen of the Industrial Commission:

Robert Lockwood came from England with Winthrop in 1630. One hundred and forty-seven of his descendants, one of whom was my great-grandfather, participated on the side of the colonies in the war of the Revolution. I refer to this that there may be no questions as to my Americanism.

It seems to me as though this reference is proper from the fact that it has become the custom of the monopolistic classes and all those who are fawning for favor at their hands to stigmatize as anarchistic and un-American any expression not in harmony with the present monopolistic condition of affairs.

I am a native of the State of New York. I left the farm in Erie county of that State in 1865 and went to the oil regions of Pennsylvania, and have been engaged in the work of producing oil ever since.

EARLY RAILWAY DISCRIMINATIONS.

Away back in the early part of the sixties some of the refinery men in the oil regions who did not have the ear of the railway managers were unable to get a freight rate over the railroads that would enable them to sell their oil in New York and the export cities at a profit. They were obliged to sell the refined oil to the men who afterward helped to create the Standard Oil Company, for these men even at that early date seemed to have an advantage in freight rates that enabled them to market oil at a profit when no one else could.

The facts which I shall present to you I desire not to be construed as against men, for I believe that the Standard Oil people are no better or worse than any other set of men would be, armed as they have been with practically exclusive advantages over the railways of the country. But the facts which I shall present to you I desire to be construed against an

accursed system of railway discriminations which has made this great curse, the Standard Oil Trust monopoly, a possibility—against a system that has enabled the Standard Oil Company people to drive into obscurity, bankruptcy ,or servitude the men whose energy and enterprise developed the great oil-producing and refining industry of America, for before the blighting curse of railway discrimination was turned against the oil refinery men they prospered and grew rich in the refining business They doubled the capacity of their refineries, adopted new and better processes, and were going forward in a business that promised much for themselves and their descendants.

But when the conspiracy between the Standard Oil Company people and the railways was consummated all men not included within the favored few were condemned to financial obscurity or ruin. No business ability however great, no better process however superior, could triumph, when the highways over which you must go to market were closed against you and manipulated in the interest of your competitors.

As long as there were open and equal rates over the highways of the country, many growing and prosperous refineries were built at every favorable point—at Franklin, Reno, Oil City, Rouseville, Petroleum Centre, Pioneer, Titusville, Warren, Pittsburg, Cleveland, and Corry. The competitive contest in the business forced hundreds of the best minds to the study of better and more economic processes in refining, and the most rapid strides were made in perfecting and cheapening cost.

Many refinery men made many buyers of crude oil, and the producer selling his oil in the competitive market was enabled to obtain a fair share of the profit in the business. The consumer buying his oil from competitive sellers was enabled to receive the benefit of each and every economy in the process of producing and refining petroleum.

THE SOUTH IMPROVEMENT COMPANY CONTRACT.

In 1872 the men who had been entrusted with the management of the highways of the country, understood so imperfectly their duty as common carriers to the public that they entered into a contract with the men who afterwards created the Standard Oil Company. This contract was known as the South Improvement Company contract, and was between a corporation of that name and five trunk railways—all of the railways that entered the oil regions of Pennsylvania.

This contract provided that the railways should increase the freight to about double what they had been charging on all oil shipped; that they should pay back a rebate to the South Improvement Company an amount about equal to said increase of freight rates; that they should pay to the South Improvement Company a like rebate on all oil that anybody and everybody else shipped; that they should break up and destroy all refinery men outside of the South Improvement Company by high rates of freight; and that they were to keep watch and report to the South Improvement Company all the business and shipments which any of these outside refineries should make.

Now, Mr. Chairman and gentlemen, I desire here to say that everything that the railway companies publicly contracted to do for the South Improvement Company in 1872, the railway companies have since secretly and persistently done for the benefit of the Standard Oil people, as I will prove to you. I shall prove it, too, in the face of the fact that whenever any of the Standard Oil Company's people or their agents or the railway people who knew the facts have been subpoenaed to testify they have almost invariably refused to answer, shielding themselves behind that provision of law which provides that you shall not force a man to testify to that which will convict him of a crime.

The men who developed the oil regions of Pennsylvania were of the best families of the Republic. The ancestors of many of them helped to win our independence as a nation, and when the provisions of the contract of the South Improvement Company became known, it created such a furore in the oil regions as has seldom been seen. Men saw the principles of equal rights destroyed, the highways over which their products must go to market being in the hands of a set of brigands, who pledged themselves to rob the people of an average of more than $1 a barrel on all the oil they produced, and give it to 13 men who constituted the South Improvement Company.

The public press of the oil regions at that time had not yet been subsidized and it gave the alarm. Men came together and consulted, meetings were called, and the more that was learned of the provisions of the South Improvement Company contract the more awful the crime which was attempted against the rights of the people developed to be. Mass meetings at Franklin, Oil City, Titusville, and Parkers were attended by thousands. Men determined that if the railways were to be used to destroy the great American right of equality they would have no railways, they would tear up their tracks and burn their bridges.

SOUTH IMPROVEMENT COMPANY CHARTER REVOKED.

The railway companies became alarmed. A committee of the producers and refiners went before the legislature, then in session at Harrisburg, and secured the repeal of the charter of the South Improvement Company. The railway officials made fair promises to give everybody equal rates, and the producers and refiners, thinking that they had won a victory and their rights would be respected, went about their business. Right here I desire to state that the battle of the producers in the oil regions has been continuously and persistently conducted upon that same principle. They asked no favors beyond this, that they should be accorded equal rights over the highways of the country.

But it soon became apparent that the railway companies were not keeping faith; that in fact they were doing for the Standard Oil Company people

secretly just what they had publicly contracted to do for the South Improvement Company. The independent refiners were fast being driven to the wall, while there was evidence of the greatest prosperity among the Standard Oil people's refineries. Very few of the facts of this period have leaked out, as when the Standard Oil Company people or the railroad people who knew the inside facts were subpoenaed to testify they almost invariably, under the advice of their counsel that their evidence might incriminate them, refused to answer.

But by the evidence in the case of the Standard Oil Company against W. C. Schofield, at Cleveland, Ohio, we learned that the profits of refining, including railroad rebates for four of these years, was an average of more than $2 a barrel, a profit in refining which, if economically managed and honestly capitalized, amounted to more than 400 per cent annually; while at the same time the refinery men who did not have the favor of the railroad companies were being driven into bankruptcy and ruin, while the producers, much of the time, were forced to take a price for their oil below the cost of production, and the consumers to pay two prices for the oil that they burned in their lamps.

STANDARD OIL COMPANY SECURES CONTROL OF THE PIPE LINES.

I have a record of 26 pipe lines built in the early part of the seventies to transfer oil from the wells to the railways. These pipe lines were mostly built by producers in their struggle for deliverance from monopolistic control. The Standard Oil Company people, having secured control of the United Pipe Line and American Transfer Company, began a campaign to bankrupt, destroy. and absorb the pipe lines built by the producers. The Standard Oil people, having a large rebate on all the oil they shipped and on all the oil that anybody else shipped through any of these different pipe lines, could go into the field and pay a little more at the wells, and could sell oil at a little less at the seaboard than any other shipper, and still only use a small fraction of the large rebates which they were receiving from the railway companies; growing rich themselves while they were bankrupting and absorbing the pipe lines built from the meager means which the producers were able to wring from the grasping greed of this great monopoly. Finally the producers and refiners came to understand that the highways of the country—the railways—were in the hands of a set of highwaymen, who, every time they went to market, would rob them of all of their profit and a part of their principal and hand it over to the Standard Oil Company people, helping to fasten that monopoly upon us. Mr. Chairman, if you must be robbed it does not make any difference to you whether Dick Turpin does it through the instrumentality of a pistol, or whether John D. Rockefeller does it through the instrumentality of a railroad.

There could be but one end to that kind of business—bankruptcy and financial ruin of the independent pipe lines. For the sworn evidence to prove all of the above statements, I desire to present the commission extracts from the evidence before the Inter-State Commerce Commission, before the courts, and before both State and national investigating committees.

RAILROADS PAY REBATES TO THE STANDARD OIL COMPANY.

I have stated that interested parties refused to testify, but there is always some way for the truth to come out. There arose a little unpleasantness between the Pennsylvania Railroad and the Reading Railroad, and we were enabled by subpoenaing the assistant comptroller of the Reading Railroad, in the case of the Commonwealth of Pennsylvania against the Pennsylvania Railroad and the Standard Oil Company, to bring into court the settlement sheets showing their settlements for the transportation of oil. Some of these sheets showing that there had been rebates paid to the Standard Oil Company to the amount of $1.10 a barrel.

Mr. A. J. Cassett, third vice president of the Penn sylvania Railroad, being subpoenaed to testify in regard to these settlement sheets and the rate on oil, was asked the rate per barrel. The answer was: "$1.90." Question. "What was the actual rate?" Answer. "If shipped by the Standard Oil Company, 80 cents a barrel." The open acceptance was $1.90; but, after deducting the rebate of $1.10 which the Standard Oil Company people received, the actual rate would be 80 cents. Now, further investigation showed that, through the terminal charges of corporations in which the Standard Oil Company was largely in control, the railway companies only actually had 35 cents a barrel to divide between themselves for the transportation of this oil for the Standard Oil Company, while an outside refiner and shipper would be obliged to pay $1.90 per barrel. Question. "I understand you, Mr. Cassatt, that this 22½ cents paid to the American Transfer Company is not restricted to oil that has passed through their lines?" Now, mark his answer, because it is a remarkable one. Answer. "No, sir; it is paid on all oil received and transported by us, as I have before stated." Question. "Now, you will find a drawback of $34,000—$41,000 less the $7,000, the Buffalo, Philadelphia. and New York proportion. (Part of this oil was shipped over a road that was not in the combine.) Could you tell who that drawback was paid to?" Answer. "Forty-nine cents per barrel went to the American Transfer Company and the Standard Oil Company under the arrangement which I have already explained." The testimony of J. D. Archbold showed rebates paid to the Standard Oil Company of 64½ cents a barrel.

It was impossible about that time and during the growth of this monopoly for outside shippers to get any cars for transporting their oil. The testimony of W. L. Fox, who owned a pipe line, Warren Gray, and others shows that the railways refused to allow the independent shippers cars, and that they were unable to move their oil.

Q. (By Mr. Farquhar.) What year was that? A. That was in 1878, I think. I wish to present here an extract from a letter of Mr. Daniel O'Day to Mr. Cassatt, accepting the commission or rebate. Now, I suppose you know that Mr. O'Day is the general manager, almost the generalissimo, of the Standard Oil Company. A very large percentage of the brains of that concern is done up in that little Irishman's head. It reads as follows:

"I here repeat what I have once stated to you, and which I ask you to receive and treat as strictly confidential, that we have for many months received from the New York Central and Erie Railroad certain sums of money, in no instance less than 20 cents per barrel on every barrel of crude oil carried by each of these roads. I am constrained to say to you that in justice to the interests I represent we should receive from your company at least 20 cents a barrel on each barrel of crude oil you transport.

"In submitting this proposition I feel that I should ask you to let this date from the 1st of November, 1877, but I am willing to accept as a compromise (which is to be regarded as strictly a private one between your company and ours) the payment by you of 20 cents a barrel on all the crude oil shipped, commencing February 1, 1878.

"I make this proposition with the full expectation that it will be acceptable to your company, but with the understanding on my part that in doing so I am not asking as much of the Pennsylvania road and its connections as I have been and am receiving from the other trunk lines."

Now here is an extract from a letter of A. J. Cassatt to Mr. R. W. Downing, comptroller of the Pennsylvania Railroad.

Q. (By Senator Mallory.) What court was that case in? Was it in the supreme court of Pennsylvania? A. It was taken before an examiner of the supreme court. The extract is as follows:

"I agreed to allow this commission from and after February 1, until further notice, after having seen receipted bills showing that the New York Central Railroad allowed them a commission of 35 cents a barrel, and that the Erie Railroad allowed them a commission of 20 cents a barrel on Bradford oil and 30 cents a barrel on all other oil, and that they had been doing so continuously since the 17th of October last.

"Of this, however, you saw the evidence yourself in the bills which I submitted to you last week. Please therefore prepare vouchers in favor of the American Transfer Company, per Daniel O'Day, for this commission of 20 cents on shipments during February, March and April, and hereafter make settlements monthly."

In the same report will be found a letter from Mr. A. J. Cassatt to Mr. Daniel O'Day, dated May 15, 1878, in which he says: "Your favor of February 15 has been received, and direction has been given to allow you from and after February 1, 1878, the commission therein asked for, until further notice.

The statement of the Pennsylvania Railroad shows that the 20 cents a barrel agreed to amounted during the months of February and March, 1878, to $68,753.50, which was paid over to the American Transfer Company by the Pennsylvania Railroad for the benefit of the Standard Oil Company's people. I have a vivid remembrance of that time. I was interested in a pipe line that was competing with the American Transfer Company for the oil produced in Clarion county. I do not believe that at that time the American Transfer Company had over $60,000 invested in all their pipe line system, and yet in two months they received in rebate from the Pennsylvania Railroad Company alone $68,753.50. I remember what a hard time we had in keeping alive, financially, the old Atlantic Pipe Line Company. The American Transfer Company was paying a little more for oil at the wells than we could get for it after we had piped it and loaded it on the cars. I can imagine now how financially easy the old Atlantic Pipe Line Company would have been if the Pennsylvania Railroad Company had poured into its coffers $30,000 or $40,000 a month. Remember, this $68,753.50 was from the Pennsylvania Railroad alone. What the Erie and the New York Central were paying them I do not know, for there is no record; but men who have studied the evidence in the Hepburn committee's report claim that the evidence shows that the five trunk railways paid to the Standard Oil Company people $11,000,000 in rebates in 16 short months. Reverse these conditions and the Atlantic Pipe Line Company would have driven the American Transfer Company into bankruptcy, just as the Atlantic Pipe Line Company was driven. Railway discrimination means ruin to any enterprise that is discriminated against, and it means monopoly for any enterprise discriminated for.

DESTRUCTION OF INDEPENDENT PIPE LINES.

Upon the question of the destruction of these independent pipe lines, Mr. W. T. Shidey, testifying before the Hepburn committee, said, in answer to a question as to whether the Hunter and Cummings Pipe Line, which was one of these independent lines, was shut out of the market: "Yes, sir; they were shut out of the market practically." The history of the Hunter and Cummings Pipe Line was the history of all the independent pipe lines in the oil regions. By railway discrimination they were practically shut out of the market. Concerning the effect which the Rutler circular—providing for a rebate for certain pipe line companies—had upon all the pipe lines not in the United (Standard) Pipe Line pool, Mr. E. G. Patterson testified before the Hepburn committee as follows: Question. "To whose benefit did the 20-cent rebate provided for in the Rutter circular inure?" Answer. "Entirely to the United (Standard) Pipe Line. The result of it was that the United Pipe Lines absorbed 80 per cent. of the 20 lines that were then in existence in the country." To which I desire to add that they ultimately absorbed them all. The testimony before the Interstate Commerce Commission in the Titusville and Oil City independent cases goes to prove that the railways had turned their terminal facilities for the transfer of oil from the cars to the seaboard in New York over to the Standard Oil Company, so that the independent oil refiners could not use their tank

cars in transferring oil to the seaboard, and had to ship their export oil all in barrels.

Q. (By Mr. Jenks.) Do you recall the date of these cases? A. They were about 1878 and 1879. Then came the discrimination against barrel shippers and in favor of tank shippers and in the interest of and for the benefit of the Standard Oil Company, and when the Interstate Commerce Commission ordered the railway companies to stop this discrimination they ignored the order. The evidence goes to prove that the railway companies adopted a system of false billing in the interest of the Standard Oil Company and against the independent refiners. The evidence further goes to prove that after the independent oil refiners had spent many years in building up a trade for their oil in the New England States the railway companies, in the interest of the Standard Oil Company, put up the railroad rates to New England to the independent refiners and shut them entirely out of that market. The work of years was destroyed in an hour by an act of these railway conspirators.

All of this evidence, hundreds and hundreds and hundreds of pages of it, goes to prove without a shadow of a doubt that the railway companies all through these years were doing for the Standard Oil Company secretly just what they had publicly contracted to do for the South Improvement Company in 1878.

NO REMEDY FOR RAILWAY DISCRIMINATION IN THE COURTS.

Now, what is the remedy? There is practically no remedy in the courts. They are too slow and expensive. These great railway combinations, in cooperation with the trust organizations, can "razoo" a man up and down through the courts, from one to another for 10 long years, until he is financially exhausted and his business ruined. Why, gentlemen, the Cox case, which related to anthracite coal shipments, with all the power and influence of the Interstate Commerce Commission behind it, has been before the courts for 11 long years, and is yet unfinished. This evidence goes to prove that these railway discriminations and favoritism were continued in favor of the Standard Oil Company and against the independent refiners even after the interstate commerce law was upon the statute books.

Now, then, in the face of all the wrongs which I have enumerated to you, the Oil Producers' Council, a body elected from the different producing districts, began criminal action in 1879 against the Standard Oil Company and the Pennsylvania Railroad for conspiracy against the public. This action was brought in the courts of Clarion county, Pa. The case was brought in the names of Col. J. A. Verra and myself. The case was prepared at enormous labor and expense. The evidence at hand to prove the facts, some of the conspirators were before the court and the jury, with almost a certainty that, with the evidence at hand, they would be convicted and sent to the penitentiary to pay the penalty of their crime; and then three members of the supreme court of Pennsylvania took original jurisdiction in these criminal cases and took the indicted conspirators away from the courts of Clarion county and hung the case up.

The late Franklin B. Gowen, a man of great integrity and ability, who was a member of the constitutional convention of Pennsylvania in 1873, said before a committee of Congress here in Washington: "That if that constitutional convention did anything effectually it was when it took original jurisdiction in criminal cases away from the supreme court of the State." And yet when the men who had entered into a conspiracy to monopolize the great oil producing and refining industries of that State had been indicted and were before a jury of their peers, we find members of the supreme court ready to stretch, aye, violate, the constitution in order to protect them from just punishment. The producers and refiners, exhausted and impoverished, fighting for their right to do business in this free country, found not only the railway companies, in league with the Standard Oil Company, against them, but members of the supreme court ready to do the bidding of the Pennsylvania Railroad and the Standard Oil Company and protect indicted conspirators from just punishment for their crimes.

Read the record of the Matthews case against the Standard Oil people for conspiracy to blow up his refinery and ruin his business. Read the evidence of Matthews; read the evidence of his partner, whom they had bribed and debauched to betray his associate. Read the evidence of this man, whom they had spirited about from the Atlantic to the Pacific, keeping him under cover, under an assumed name, at Boston and elsewhere—keeping him under cover for four long years, that his evidence might not be had by the courts; keeping him until the load of crime in his heart became too great for him to bear, and conscience forced him to go back to Buffalo and confess to Matthews. Note how Matthews, struggling with poverty, yet determined that justice should be done, had spent the few remaining thousands he had left in these litigations, and how finally his little refinery was forced into the hands of a receiver, and he was financially ruined. Read it all, for I say to you that no honest man can read the record of this case without feeling that there was a crime committed against the State. And that's not all. Matthews had verdicts for $270,000 against the Standard Oil Company people in his civil damage cases, and the creditors of Matthews, under this receivership, had to settle these $270,000 verdicts for $13,700. And this is not all. These great monopolies and the political bosses—who are but the creatures and servants and instruments of these great monopolistic combines—these bosses secure, in my opinion, nominations of judges, and then, through the help of the party machinery and a liberal supply of corruption funds, succeed in electing them; and there, in our higher courts, men, elected by corruption funds, sit to dispense their kind of justice to the American people.

The remedy is not in courts. You cannot reach these fellows in the courts. They will circumvent you. The thought is fast becoming fixed in the minds of the common people that these great railway combinations, extending as they do from the Atlantic to the Pacific, and from Canada to the Gulf, these great combinations

of corporate capital, are gradually packing our higher courts with men who will do their bidding, or, rather, with men who are in sympathy with the present monopolistic condition of things.

THE INTERSTATE COMMERCE ACT.

Now, then, in 1878 the producers of petroleum in Pennsylvania had the old Anglo-Saxon confidence in the justice of the courts and in the power and omnipotency of the law. If we could get a law enacted by Congress prohibiting railway discriminations we thought then there would be no more trouble. We paid $1,000 to a retired railway attorney of great abiltiy to draft us an anti-discrimination railway bill. The conditions were that it should be such a bill that when enacted into law the railroad companies could not drive a train of cars through it. I shall never forget the report which that committee made when they came back without bringing that bill from Washington. They found Judge Reagon, of Texas, chairman of the Committee on Commerce, and took the bill to him. He read it over and said: "Well, my God! this is just what we need down in Texas." You all know what a magnificent fight Reagan and the friends of that measure made in Congress for its passage. We always thought that the Cullom amendment in the Senate very much weakened it, but at last it was passed, and we had the interstate commerce law. But do you know that these great railway and trust combinations do not seem to care any more for that law than though it was not upon the statute books? On every subterfuge they evade and violate it. If they can control the appointment of Attorneys General and supreme court judges they do not care what the law is. They have become bigger than the government itself. They dare to threaten the Interstate Commerce Commission and ignore its orders, and that commission of this great government seems powerless to perform the duties provided for it in the law that created it.

Four or five years ago the Atchison, Topeka & Santa Fe Railroad went into the hands of a receiver, and about the first thing the receiver found out was that the officers of the road had paid over $7,000,000 in rebates to trusts, monopolies and favored shippers. And, while this was a State prison offense, there did not seem to be any disposition on the part of the Attorney General of the United States to bring these great criminals to judgment. These great railway combinations and monopolistic organizations seem to overshadow the government and direct and control the action of its officials.

Q. (By Senator Mallory.) Was not that before the passage by Congress of the law which subjected the party who received a rebate to liability under its provisions and which bound all parties concerned in the rebate business? A. It was at the time the Santa Fe Railroad failed, in 1893-4, long after the interstate commerce law was in operation.

Behind the power of railway discrimination the Standard Oil Company, the Sugar Trust, the Steel Combination, the Big Four Beef Combination, and the rest of these trust organizations feel so secure in their power to throttle competition and plunder the producers and consumers of America that the stock of these companies, some of it from 50 to 90 per cent. water, is selling to-day at from 200 to 400 cents on the dollar.

THE CASE OF GEORGE RICE, OF MARIETTA.

The greatest battle in the record of time has been fought by George Rice, of Marietta, Ohio, for the right to do the business of his choice in this free country. What is the record of that case? In the latter part of the 70's the railway managers, in order to cripple Rice in the interests of the Standard Oil Company, doubled the freight on oil at Marietta, where Rice's refinery was. But the raise was only on oil; no other freight was raised. It was also only at Marietta. Ten miles below, at Parkersburg, on the Ohio River, the Standard Oil Company had a refinery, and the rate was not raised on oil from there, nor was it raised at Wheeling, above Marietta. The railroads raised the rate on Rice's oil at Marietta, but no raise was made anywhere else. There is evidence to prove this statement.

What further? The railroads over which Rice had been shipping to the southern markets raised the rate to him from 29 to 212 per cent. over and above what the Standard Oil Company had to pay. Finally they refused to give Rice any rates at all.

What further? The railroads paid the Standard Oil Company rebates on the oil that Rice shipped.

Q. (By Mr. Kennedy.) How much? A. I have given you the reference so you can tell. I did not go into that.

What further? The railroad companies discriminated against Rice in favor of the Standard Oil Company to an amount equal to $199 per car on cars carrying 100 barrels.

I hope I am not asking too much when I ask the members of this commission to read these 43 pages giving the history of George Rice's exertions to do business over these American railways. Every statement therein made is supported by sworn evidence before the Interstate Commerce Commission, before the courts, and State and national investigating committees. When you have read this report of crime and seen how the rights of American citizens are destroyed by these railway companies, I would suggest, and I think it proper, that when John D. Rockefeller appears before you, you ask him whether, if the railway companies had treated him as they did George Rice, he thinks that he could have succeeded in business.

Q. (By Senator Mallory.) What is that (referring to book in witness' hand)? What book is that? A. Three chapters of H. D. Hyde's great book called Wealth vs. Commonwealth.

It does not seem possible that, under this great government, based upon the doctrine of the equal rights of man, such outrages could be possible. Yet this great government, through its Congress and its commissions, seems powerless to prevent the wrongs which I have enumerated.

THE REMEDY FOR RAILWAY DISCRIMINATION.

What is the remedy? Take the railroads away from the corporations; make them public property; let the government own and run them; make them highways over which the people can go to market upon even terms. The $11,000,000,000 of capital combined in the railways of the republic, organized under joint tariff and passenger associations, has throttled the law of competition and constituted one gigantic railway trust, controlling the highways of the people dictating who shall and who shall not do the business of the country, and condemning this man to poverty and that man to riches. The holders of this $11,000,000,000 of capital, with those holding the capital of the trusts and monopolies, have constituted themselves the political dictators of this country. They furnish millions of dollars for corrupt political campaign purposes. They assume to own the votes of all the men in their employ, and he who becomes politically obnoxious to them is blacklisted and turned out to starve or to hunt a new occupation. Shrewd politicians, backed by this combination of capital and this power, have constituted themselves political bosses. These political bosses are but the creatures and servants and instruments of this great corporate power, and these bosses are dictating the nominations of legislators, congressmen, senators, and judges satisfactory to their masters. In this way they are controlling legislation and escaping punishment for their crimes. It takes a strong man, Mr. Chairman, well anchored in the confidence and affection of his people, to triumph politically against this combined capital and power, and just in proportion as these great trust combinations are enabled to absorb the wealth produced by the people and impoverish them, just in that proportion will the people become subservient and cowering, because the fear of hunger for wife and babies makes cowards of us all. Can the Republic survive with these railways in the hands of corporations which are fastening these monopolies upon us? These corporations, in justification of their management of the highways of the people, the railways, set forth that they are moving the freight of this country cheaper than the freight of any other country upon the globe. True; but out of their own mouths they convict themselves of a great crime. I hold in my hand a receipted freight bill for the shipment of a carload of oil-well supplies from Harmony, Pa., to Unity, Pa., a distance of 49 miles. The cost was $46.60 for this carload of 16 tons, or $2.91 a ton for the 4 miles, or $0.0593 per ton per mile. I have freight bills showing that I have paid $0.0432 per ton per mile in carload lots. A large percentage of the freight of the American people is moved in less than carload lots. I have here receipted freight bills for one and two ton lots, and I find that I paid $0.1357 per ton per mile.

Q. (By Mr. Jenks.) Have you any evidence to show that, over the same road for the same distance and the same kind of freight, any lower rate has been given to anybody else? A. No; I have not. It is a small matter and I am only shipping occassionally, you know. A large percentage of the freight of the country is shipped by men who ship a car this month, a car next month, etc.

Q. These freight bills are for fifth and sixth class freight, which I think oil-well supplies are. Does not everybody pay the same freight? A. For small shipments I suppose they do. Now, statistics show that all the freight of this country, including everything, is moved at the average rate of $0.0085. per ton per mile. These facts convict the railroad managers of a great wrong, for these freight bills show that the people are being robbed for the benefit of the stockholders of the railroads; and the statistics show that the stockholders of the railroads are being robbed for the benefit of the monopolies, trusts, and favored shippers. Here is the problem: If the people are obliged to pay upon their shipment of freight, as these bills show, from $0.0432 to $0.1357 per ton per mile for the movement of their freight, and all of the freight of the country is moved for $0.0085 per ton per mile, how much less than $0.0085 do the monopolies, trusts, and favored shippers pay in order to bring this average from $0.1357 per ton per mile down to $0.0085 per ton per mile? The answer to the question will answer the oft-repeated question of why so many of our railroads are in the hands of receivers. A proper answer to this question will answer why it is that so many of our railway managers are becoming multimillionaires while the railroads are becoming bankrupt. The record of the last 25 years has demonstrated that as long as the railways are in the hands of corporations they will use them for the benefit of their friends, or inside combinations, and for the purpose of destroying the great principle of equal rights, which is the foundation stone of our Republic.

Take the railroads away from these corporations, and give every man an equal right in the transportation of his products. I know the independent oil producers and refiners of America, and if you will establish equality over the railways, with a guaranty that that equality will continue, I feel safe in saying that in less than 15 years the independent oil producers and refiners will drive the Standard Oil Company into a secondary position in the oil trade of the country. These great trust combinations do not know the first principles of economical management. By virtue of the great flow of wealth which has come to them from railway rebates and trust possessions, they have not been obliged to study the principles of economy a moment in their lives, By this monopoly process they have been able to take more money from the people than they absolutely know what to do with. Reestablish the equality of our people with respect to the railways of the country and there will be no more coal miners strikes; soldiers and deputies will not be called upon to shoot down American citizens like dogs in order to force them back under monopolistic control, for then the miner can ship his car of coal just as cheap as the biggest coal combine in the land. Men do not strike and go out and starve except as a last resource. Establish the equality of our people over

the railways of the country and then the coal miners, when they become dissatisfied for any reason, will get together and form a little coal company of their own instead of striking. They will lease McCoomse's or McLaughlin's farm, open up a coal mine of their own, and ship their coal, the product of their own labor, to market upon equal terms with the biggest coal combination in the land. How could these great overcapitalized and extravagantly managed coal combinations stand such competition as that? They could not stand it at all; it would be mighty hard on the big coal combinations, but it would be justice and a wise national policy. With absolute equality over the railways of the country, so that every butcher could ship a car of cattle just as cheaply as the Big Four Beef Combine, that combine could not hold the monopoly of the meat trade of America for 24 hours. Under government control, the letter of an oil producer, a coal miner, or butcher goes to its destination with the same speed, at the same cost, and with the same precision as the letter of an Armour or a Rockefeller. Send their oil, meat and coal to market upon the same terms of equality and it will not be long before these monopolistic combinations will be getting rid of their $25,000 a year lawyers and managers upon the plea that their business will not stand such high-priced men. These managers will soon be engaged in building up businesses of their own, and the lawyers in a better business than advising their principals just how far they can go without getting behind the bars.

GOVERNMENT OWNERSHIP AND CONTROL OF THE RAILWAYS FEASIBLE.

How can the railways be taken away from the corporations? The public welfare demands it, and the power exists under the right of eminent domain of the State. The States can condemn the railways for the public welfare just as the private lands were cendemned upon which the railways were built for the public welfare. Pay the corporations for them just what they are truly worth, and in this transaction let there be no injustice either to the people or to the stockholders. But, someone will say, how could the government pay the interest on the immense public debt which this purchase would create. Mr. Chairman, the people in this land, who are the government, are paying it today. These railway companies are taxing the people under exorbitant freight rates for the payment of the interest on all of their corporate debt, money dividends upon watered stock, and hundreds of millions annually for the benefit of the trusts, monopolies, and favored shippers. The railways are the peoples' highways, and under government ownership they are only changing their managers. One of the greatest judges that this land ever produced, in my judgment, once said that "a public highway cannot be private property." An important reason for government ownership consists in the fact that the bonded debt of the United States for the purpose of acquiring the railroads could be placed at from 1½ to 3 per cent less interest than is now being paid upon their bonded debt. This great reduction in interest would be an important factor in cheapening the cost of transportation. But a greater and more overshadowing reason for government ownership is that then we should be able to shake off the grip of these monopolies from the throats of the people. But some very good men, however, fear the power of patronage which government ownership would give the party in power. I do not fear it. That can be controlled by civil service laws. But even if government ownership should be a source of strength to the party in power, that party would have to be responsible to the people for a just, wise, and fair administration of this great public property in the interests of the people. Under corporate management, all of the power and influence of these great railway combinations, together with that of the men whom they control, is thrown into the balance in favor of this party or that party, according to whichever will secretly agree to serve them the best. They hold the balance of power in many of the States, and can elect the candidates of the party whose bosses will guarantee the greatest subserviency to their will. The party that obtains control by virtue of this influence is not held responsible to the people for the maladministration of these public highways, as they would be under government ownership. It is because these $11,000,000,000 of railway capital, together with all the men which it controls, are in politics clear up to their armpits, and it is because this capital and these men are in politics for corrupt and selfish purposes, irrespective of the public welfare. That capital of $11,000,000,000, together with all the capital of the trusts, is corrupting our public affairs and debauching our public men. That constitutes one of the most important reasons why the people should take the railways away from the corporations. The record of the last 25 years has demonstrated that the government must own and control them or else they will control the government.

In the oil regions of Pennsylvania there is left a set of men who have never bowed the knee to Baal, but have battled on continually for their rights as American citizens in the use of the railways of the country. It has been a long battle; some of them who buckled on the armor in 1872 have been claimed by the hand of death; some of them have gone down under the blandishments and money of the Standard Oil Company; many of them have become bankrupt and been reduced to servitude and even obliged to go to work for that great monopoly in order to obtain bread for their families; some of them, with a deep sense of the great wrong that has blighted all their hopes and darkened all their future lives, with a deep sense of the great wrong that has driven them from the highways of the country, and chained them to the rock helpless while that great monopoly robbed them, have been driven to the grave of a suicide and to the insane asylums; but there are enough left to keep the faith

and battle on for commercial liberty and equality. They have never faltered, but have battled as best they could with the means at their command. They first built the 26 pipe lines to which I have referred and then found it was railway discrimination. They then went to the courts, and when the courts failed them, they went to Congress for the inter-state commerce law. When the inter-state commerce law failed them, they attempted to hew a way for themselves by building a pipe line to the ocean where commerce is free, thinking, hoping, praying that somewhere beyond our borders they might find a government where the equal rights of man are maintained upon the highways. We have found it in the great Empire of Germany, where the government owns and controls the railways. The poorest man in Germany can ship a barrel of oil from one end of Germany to the other just as cheaply as the Standard Oil Company can. In Germany the independent oil producers and refiners of America are not only able to compete successfully with the Standard Oil Company, but in addition they are enabled to earn flattering profits upon their entire capital. Give us national ownership of the American railways, which will insure and perpetuate equal rights, and we will soon give the people of America their oil at competitive rates. The people of America will not then be obliged to pay 40 per cent dividends on Standard Oil Trust stock, at least 50 per cent water, because there will be plenty of capital ready to serve them at 6 per cent profit upon the actual amount invested. I take no stock in the idea that inordinately great capital produces cheaply; where monopoly begins there improvement ends; it is competition that drives men to economy, improvement, and invention; it is monopoly that demands great profits. While competition was putting refined oil into tank steamers for the competitive markets of Germany at two cents a gallon, monopoly, backed by railway favoritism, was forcing the people of Texas and Arkansas to pay 25 cents a gallon for the oil that they burned in their lamps. The attorneys of the Standard Oil Company, by a liberal use of the public press and a system of comparisons, have imposed upon the American people the thought that the Standard Oil Company has furnished them their oil cheaply. If the people have been served cheaply by this great monopoly what is the meaning of the $500,000,000 which it has garnered? It is not the purpose of trusts to serve the people cheaply. It is their purpose to create monopoly and then force producers and consumers to pay dividends on billions of watered capital. Before the Sugar Trust had fully fastened its fangs upon us I bought good granulated sugar for my family use at $3.90 a hundred. Today the Sugar Trust is forcing the American people to pay from $5 to $6 a hundred upon the same grade of sugar, a difference, I am told, of more than $200,000,000 annually. Two hundred million dollars, produced by the American people, are by this process transferred from the pockets of the people to the coffers of the Sugar Trust; and then Havemeyer says, "What are you going to do about it?"

How can this be prevented? First, by assuming control of the railways and guaranteeing to every man equal rates on the transportation of his products, and then by enacting a law forcing the great trusts and monopolistic combinations to fix a price upon their goods which, freights considered, will be the same in every township and hamlet of the land. When the price is changed at any point it must be changed everywhere. Make a violation of this law by the managers of corporations a State prison offense. Corporations are the creatures of the State; the State has created them and has the right to control them in such a way that they will not be detrimental to the public welfare. Such a law would prevent the trusts and combinations from putting up the price in one section of the country, where there is no competition, and forcing the people there to pay the cost of destroying competition in another section. Such a law would prevent the corporations from forcing the people to pay for a war of annihilation against growing competition. It would protect and encourage competition upon every hand and cure the evils which are upon us. Say to all of our people—mine, manufacture, produce—the product of your labor shall go to market at rates equal for all, and you shall be protected in fair competitive combat. Do this, and the great over-capitalizer and unweildy trust combinations will wither and go down before the energetic, intelligent, and active competitive capacity of the American people.

Q. (By Mr. Kennedy.) I gather from the statements which you have just made that you believe freight discrimination and favoritism to be the mother of all the great trusts of this country? A. I do, largely, yes; that is really the foundation; a trust must be protected in some way; the brains of the country are not in the heads of a few men. The protection which has created the Standard Oil Company, the Big Four Beef Combine, and trusts and monopolies of that class, is that of discrimination in freights.

(After a recess from 1 to 2 p. m. the examination of Mr. Lockwood continued.)

METHODS BY WHICH THE STANDARD OIL COMPANY SECURED CONTROL OF THE PIPE LINES

Q. (By Mr. Jenks.) I understood you to say that there were quite a number of different pipe lines in the earlier days in Pennsylvania that were either forced to suspend operation or were bought up by the Standard Oil Company and united. How many pipe lines did you mention? A. I have a record of, I think, about twenty-six.

Q. Can you tell us the methods by which the Standard Oil Company secured control of the pipe line industry? A. Well, in those early days their policy was to go to the wells and bid more for the oil than anybody else could pay. For the last 15

years they have adopted a policy of paying what they call a premium on oil that is accessible to the competing pipe lines. When a new pipe line starts into a particular district then the oil of that district becomes very valuable, the Standard Oil Company will put a premium on it, say, of 20 or 30 cents a barrel. When they have finally succeeded in driving out or buying up the competing pipe line the oil is no longer any more valuable than other oil, and then they take the premium off. Let me give you an illustration: In 1887 the Craig, Elkins & Kimble Company built the Western and Atlantic Pipe Line. They made their first shipment of oil on October 11, 1887. At that time the Standard Oil Company was paying 69 cents a barrel for crude oil at the wells. The Western and Atlantic Pipe Line did not fairly get started in business until the spring of 1888; but by that time the exchange market for crude oil, under the growing competition, was 88 cents per barrel, and the white sand oils of Butler, Armstrong, Allegheny, and Washington counties, into which the Western and Atlantic Pipe Line ran, had become so valuable that the Standard Oil Company was paying a premium of 20 to 25 cents a barrel, which, added to the 88 cents, gave the producers of those counties $1.08 and $1.13 a barrel for their oil at the wells.

Refined oil was selling in August of that year for 7⅝ cents a gallon, including the barrels, in New York City and export points. In November, 1889, the Standard Oil Company was paying us $1.30 a barrel for oil at the wells, and refined oil was selling in New York for 7½ cents a gallon. Competition was putting crude oil up to the producers and refined oil down to the consumer. I have a very vivid remembrance of this time, because I was opening up some territory on the Little Connequenessing creek, in the western part of Butler county, Pa., in what is known as the 100-foot rock. I had leased the Cable, Charley Young, Edward Young, Eyeholtz, and Hayes farms. I was getting some magnificent wells. One on the Eyeholtz farm started off at 125 barrels an hour. I had one well on the Charley Young farm that averaged 1,000 barrels a day for a long time. I think I drilled about 40 wells on this property. Competition was giving me all this oil was worth, as compared with what the consumer was paying for it, and I was getting rich. I was getting from $1.10 to $1.30 a barrel. About this time it became evident there was a 100-foot oil belt extending from the western part of Butler county down into the eastern part of Beaver county, Pa.

I worked night and day, and never stopped for anything, until I became interested in about three miles of this oil belt. Starting on the southwest I got the Fogle, Kaneff, Shrumm, Trautman, Allen, Passavant, Coker, Fankee, McCurdy, Eyeholtz, Getman, Eichenower, and Moyer farms. I was interested in 2½ miles of this oil belt solid; I had it all. I thought I would make a million. I got some grand wells; one on the Trautman farm started off 1,200 barrels a day. About this time the Standard Oil Company gave the Elkins and Kimble crowd their price, and bought their pipe lines and refineries. The very next day the premium came off from that oil. It was not any better then than any other oil. As soon as there was no competing pipe line its superior qualities were gone, and from that day competition was gone. The price of oil gradually fell to 53 cents. They kept the market below 60 cents for one whole year. I did not sell a barrel of oil for one year above 60 cents. The average, I think, was about 56 cents. The next year I was obliged to sell all my oil at less than 70 cents a barrel, and below the cost of production. This condition continued for two years. The Standard Oil Company practically confiscated all of that magnificent property, and instead of having $1,000,000, which I should have had, if I had been able to secure my share of the profit that was made on that oil, I absolutely had to mortgage my property to get money to pay my debts contracted for the tubing, casing, engines, boilers, rope, tools, and men. All the value of that immense property, that would have made any man a millionaire, was transferred to the coffers of the Standard Oil Company.

Q. (By Mr. Kennedy.) What did you say was the price per barrel when it started? A. $1.30.

Q. And what was the price of refined oil? A. The price of refined oil at the time was 7⅝ cents a gallon in New York City.

Q. The cost of refined did not go down at all compared with the cost of the crude? A. No; it did not. You can see from the dates I have just given that during the period of competition when that pipe line was in existence, the price of crude oil went up and that of refined oil went down, I think, a fraction of a cent. The history of that case is the history of the manipulation of the Standard Oil Company over and over again. If the oil producers are lucky enough to find and open up a great field the Standard puts the price down and practically confiscates the profits. Of course the Standard Oil Company's newspapers will be full of cock-and-bull stories about the increase of production and increase of stocks of oil, but the facts are, that during the year which I have described, when the price of crude oil was pulled down from $1.30 to 53 cents a barrel, the entire increase would not have supplied the consumptive demand of the world for two and one-half months. All this talk about production and stock was a mere subterfuge to take from the producers the wealth they had created and transfer it to the coffers of the Standard Oil Company.

Q. (By Mr. Jenks.) Does that practically cover the explanation of the way in which the pipe lines were absorbed by the Standard Oil Company and the effects upon the producers?

Q. (By Mr. Phillips.) About 28 in number? A. Yes; I have a record here of the number and names of them, if it would be of any benefit.

Q. It is, perhaps, not worth while to name them here, if you can give us the reference to the book. [Book held by the witness.] A. Now, this is in a biographical book in which there is a speech delivered by myself on the free pipe line question 20 years ago.

DOES THE STANDARD OIL COMPANY AT PRESENT RECEIVE FAVORS FROM THE RAILROADS.

Q. In your testimony this morning you gave a great many instances of special railroad rates that were secured by the Standard Oil Company a good many years ago, and showed how, in your judgment, by virtue of these special rates, the Standard Oil Company had been built up. You cited us also the authorities by which these statements could be verified. Have you any information or any proof that the Standard Oil Company is at the present time getting any special privileges from any of the railroads? A. The evidence in the Titusville and Oil City Independent cases goes to prove that.

Q. (By Mr. Jenks.) How long ago were these cases brought? A. They were brought in——

Q. (By Mr. Kennedy, interrupting.) Did you not say 1893 this morning? A. It was about then; they were along after the inter-state commerce law was enacted. The evidence all goes to prove that the railroad companies are manipulated in some way so that the Standard Oil Company gets an advantage, and the great fear among the independent producers and refiners is that, after they have gone on and extended their trade and spent money to build up stations in which to do business in any section of the country, by some scheme the railroad companies will put up the rate on them and shut them out of that district, just as they shut them out of the New England States in the case which I cited this morning. It is the fear of railway discrimination that paralyzes men.

Q. (By Mr. Jenks.) We have had some evidence offered tending to show that the Standard Oil Company is at the present time receiving special favors. Have you yourself anything of a definite nature to offer in that direction? A. No. I am an oil producer and I do not get in touch with the railroad people so much as the refinery men do. I have no doubt that they are getting a great advantage today and probably at the end of four or five years we will find out just what that advantage is. At the time when they were getting $1.50 and sometimes more in rebates they persistently denied that they had any advantages, but ultimately the truth came out in some way and we saw then why it was that they were triumphing over the independent companies.

Q. Have you any information at the present time with reference to the freight rates on oil over the Canadian roads? A. No; I have no information on that subject.

Q. Did you not give us some instances this morning of very high rates which you had paid on some of the roads that run from Pittsburg to Union City? A. To Unity station.

Q. You showed that these rates were very much higher than the average rates throughout the country. Have you any proof of discrimination in rates between different persons or companies by those railroads? A. The road that extends to Unity is a coal road. It was built into that district to take out coal for, I think, the Buffalo and Cleveland Coal and Gas Company. I was told, while operating in that district, that the rate of freight on coal to anybody outside of that company was so high that it was impossible for them to compete at all in the market at Buffalo and in Canada.

Q. Were the rates on coal different to members of the company from what they were to outsiders, or were the rates the same to all parties, the members of the company getting their profits simply from the high rates that put money into their pockets as railroad owners? A. I really do not know the inside workings of that coal road. All I know is that the men who own coal farms there can not ship their coal. They are powerless to do any business in competition with the coal combination.

Q. Of course that might have been true, even though the owners of the road were paying the same rates, because what they were paying out in one form they were possibly getting back in another. Have you any information to show that this railroad has been acting contrary to law in making discriminations? A. I imagine that on the class of freights which I ship everybody pays the same.

Q. Is there very much freight shipped over this road besides coal? A. There has been quite a development in the oil and gas business in the region, which has made that road necessary for shipping oil supplies and pipes.

Q. You speak of this railroad running from Pittsburg to Unity. Is it a small line or a large road? A. It is part of the Allegheny system, which is a branch of the Pennsylvania Railroad.

PIPE LINES OF THE INDEPENDENT COMPANIES.

Q. (By Mr. Kennedy.) Did you not say the independent companies had their own pipe lines to the seaboard? A. After the purchase by the Standard Oil Company of the Elkins, Kimble & Craig pipe line system, when oil got down so low that it meant bankruptcy and ruin to all of us, the independent oil producers went to work and tried to hew a way out for ourselves by building a pipe line through to the seaboard. The first movement was in building what was known as the Producers and Refiners Pipe Line Company, Limited. I think that was built into the McDonald field, with the expectation of piping oil to the railroads and then shipping it in cars to the independent refineries at Oil City and Titusville. As soon as that was completed and business began, a system of discrimination was set up against them in some way. I do not remember just how it was, but it resulted in the producers having to lay a line from the McDonald field, where the first line was started, through to Oil City and Titusville and the refineries. After they had done that the discrimination began against the refined oil again. As long as these refinery men were taking the inferior oil of the Standard Oil Company which had been in tanks until the finer parts had evaporated, there was not much discrimination against them, I understand, but after they

were able to get good fresh oil from the wells shipments of refined oil were blocked. Then we undertook to lay the seaboard line from Titusville to New York or Jersey City.

Q. Have you a line there? A .The line has been built down into New Jersey, but the railroads have blocked us. The managers bought a piece of land in fee simple that went under where the highway, a wagon road, passed. In the lower courts I believe we got a verdict in favor of our right to lay the line under there and transport oil, but they finally carried the case up to the supreme court in New Jersey, and after we had laid our line, I think, 60 miles further on, that court reversed the decision and forced us to stop. I do not know, but I think we are still putting oil through there, but it is subject to final decision of the court. The verdict was reversed by which we had the right.

Q. Does the line go to the seaboard? A. It goes down now from New Jersey over the Central Railroad.

Q. (By Mr. Phillips.) From what point? A, From the end of the pipe line, I think 80 or 90 miles; it may not be as far as that to the tanks at the seaboard. This line that the Producers and Refiners Company has built is a double line. They transport the refined oil from the refineries at Oil City, Bradford, and Titusville, through to the end of this pipe line, as they do the crude oil, and then it goes on board the cars to the seaboard. The refined oil is there put into steam tank vessels and sent to Germany, where the independent producers and refiners have built three large stations, each one of them, I think, capable of holding 70,000 barrels of oil. The crude oil is refined at the seaboard. In Germany there is no railway discrimination.

Q. What I wish to get at is whether the railroads now give the Standard Oil Company any advantage over you in getting oil to the seaboard; but I judge, by what you say, that, with the possible exception of the Jersey Central, no road can do it. A. No road except the Jersey Central Railroad has anything to do with our oil from the time it leaves the well until it gets to the seaboard.

Q. They cannot, then, give the Standard Oil Company any advantage over you? A. No, not on export oil; we are on even terms with the Standard Oil Company, with the exception, I think, of about 7 cents freight per barrel.

Q. (By Mr. Phillips.) It does not exceed 15? A. No, it does not exceed that.

SHIPPING REFINED OIL THROUGH PIPE LINES.

Q. A great deal has been said about the Standard Oil Company's methods of doing business. Were they ever able to, or did they ever, ship refined oil any distance through pipe lines? A. Not to my knowledge; they have always claimed that it could not be done; that it would injure the quality of the oil.

Q. What has been proved by this pipe line running through to New Jersey? A. It has been proved that it can be done successfully. You can ship 110 fire test, which is export oil, and put through right behind it 150 fire test, and separate the oil at the end of the line without making a change of more than a barrel, which is within 20 or 30 feet of the column of oil.

Q. Is that an improvement by the independents over the Standard Oil Company's methods of handling oil? A. Certainly; very much.

Q. (By Mr. Kennedy.) Then the independent companies do have some advantage over the Standard Oil Company in getting their oil to the seaboard? A. In that connection.

Q. (By Mr. Phillips.) Does the Standard Oil Company refine a percentage of theirs at the seaboard after pumping it through in a crude state? A. Yes; I understand their export oil is nearly all refined at the seaboard.

PRICE OF OIL SHIPPED TO GERMANY.

Q. (By Mr. Jenks.) Did I understand you to say this morning that the independent refineries were supplying refined oil in Germany at two cents a gallon? A. In the contest for that trade the producers sent shiploads of oil to Germany at from 2⅛ to 2½ cents a gallon; one cargo of oil, I believe, was sent at one and nine-tenths cents a gallon.

Q. Was that for the purpose of starting the German trade? A. Yes; it was to get into the trade.

Q. They were then selling oil in Germany considerably cheaper than here? A. I think so; a good deal cheaper than it was sold to American people generally.

RELATIONS BETWEEN INTERSTATE COMMERCE COMMISSION AND THE STANDARD OIL COMPANY.

Q. Did I understand you to say that the independent oil producers were chiefly instrumental in starting the idea of the inter-state commerce law? A. Yes.

Q. And also that since the inter-state commerce law had been in force the Standard Oil Company, in particular, and the railroads, who were opposed to any restrictions upon their powers, had succeeded in your judgment, in defeating largely the purpose of the law? A. Yes.

Q. And in that connection, did you make the statement that the members of the Inter-State Commerce Commission have been threatened? A. Yes.

Q. In what way have they been threatened? A. That their powers would be tested.

Q. You do not mean, then, that the members of the Inter-State Commerce Commission had been personally threatened? A. Oh, no; they simply questioned their authority and threatened to test their powers.

Q. From the connection in which you used the expression I was not certain but that you meant to say that the members had been personally threatened. You meant simply that the Standard Oil Company and the railroads had asserted that they thought they could defeat the law? A. That the Com-

mission did not have the power to perform the duties required for it under the law.

Q. And they proposed to test that in the courts? A. Yes; in the courts. There was one case taken into the courts by the Commission. You remember the Cox case; that was eleven years ago, and it has not yet been finished.

THE PRESS SUBSIDIZED BY THE STANDARD OIL COMPANY.

Q. You made the statement also that the press had been subsidized by the Standard Oil Company. Have you any positive information of special cases in which the Standard Oil Company has subsidized the newspapers? A. Well, they have bought out the Oil City Derrick, and have hired Pat Boyle to run it. He runs it in their interest. I do not know just what the arrangements are, but the paper is conducted in the interest of the Standard Oil Company, and attacks the independent producers and their movements.

Q. (By Mr. Phillips.) Has there ever been any action brought against that paper for libel? A. Yes. I think that Senator Lee sued them for libel; they published some very damaging statements, and he brought suit against them. I think Senator Emery also brought suit against them for what they stated about him.

Q. Were either or both of these suits carried to a conclusion? A. I am not certain as to how those cases ended. My memory is that they were settled in some way, but I do not know just how.

Q. (By Mr. Jenks.) Have you any other specific cases in mind besides the Oil City Derrick? A. Well, the Titusville papers, particularly the Titusville Herald, seemed to be under their thumb, and the Pittsburg papers have now reached a point where they take all of the oil information that they publish from the Standard people. The Standard publish what they want to in the reports and in the daily papers.

Q. Your statement, then, means substantially this, that there are several papers in the section of the country in which you live that regularly make favorable reports with reference to the Standard Oil Company's methods and unfavorable reports with reference to the methods of those opposed to it? A. Yes.

Q. More particularly the Oil City Derrick? A. More particularly the Oil City Derrick.

Q. But you have no direct personal knowledge that the paper is owned by the Standard Oil Company, and your make assertions largely upon the nature of the material that is published by that paper? A. That is the source of the knowledge I have of the transaction.

Q. (By Mr. Phillips.) Has the Oil City Derrick generally been favorable or unfavorable to the independent movement? A. It is bitterly opposed to the independent movement and attacks the credit and reputation of the men who are exerting themselves for an outlet.

Q. Do you not remember the termination of their suit at Warren in regard to the libel case? A. Now, I am not sure as to that.

RAILWAY DISCRIMINATIONS RESUMED.

Q. (By Representative Bell.) Have you ever read Larrabee's book on railroads? A. Yes.

Q. What would you say as to the merits of it? A. Well, I think it is a full exposition of the railroad question in this country.

Q. Does he not develop the fact that as early as 1876 there was a tendency in the United States to interfere in political affairs? A. That is, a tendency of the Railroads to manipulate political parties?

Q. Yes. A. Yes.

Q. And to fill judicial positions with their sympathizers? A. Yes.

Q. Now, you spoke of the Standard Oil Company building up their trust through railroad discriminations. Was there any reason whatever at that time for creating the trust or anything that would enable them to build up the trust other than railroad discriminations? A. I do not think there was. The men who were refining oil were men of ability and business capacity. At least equal to the business capacity of the Standard Oil people, with the exception that the Standard Oil people recognized that it was a question of advantage in freight rates instead of a question of superior goods; that superior goods could not go over the railways unless the railways let them.

Q. They raised the price on crude oil from about 40 to 80 cents a barrel, and then if an independent company shipped a barrel of oil did they not take 40 cents of that and hand it over to the Southern Improvement Company? A. From 40 cents to $1.10.

Q. And that had the effect of destroying not only the competitors, but of destroying the value of all the independent oil wells in the United States? A. Very largely.

Q. And the market fell off? A. Very much.

Q. And forced them out of business? A. In a great many cases.

Q. Have you given any attention to the coal fields of Pennsylvania? A. No; I have not, except in a general way.

Q. Is it a fact that the railroads of the United States refuse to let any private individuals operate a coal field? A. Yes; I know that to be the case in Allegheny county.

Q. They have an independent coal company, which is a kind of wheel within a wheel, gotten up among the railroad stockholders? A. Yes; and that company is the only one that can successfully ship coal over that special railroad.

Q. If they give you a rate, do you ever have any trouble in your country in getting cars? A. Why, in those early days and throughout the time of the independent refiners' struggle that was one of the principal ways in which the railroads discriminated in favor of the Standard Oil Company. They refused to give cars to men who had oil to ship. For instance, if a man wanted 20 or 30 cars, perhaps two or three days after he needed them one or two would come, and he would not be able to get his oil into the market at the time he expected.

Q. What have you seen in the way of discrimination against towns? Has anything of that kind come

under your observation? A. Well, not personally, but in the investigation of this question I have found that towns are built by railroads and that towns are practically destroyed by railroads as far as their commerce and industry are concerned.

Q. Is it the tendency of private ownership to create commercial centers, great centers? A. Yes.

Q. Like Chicago? A. And New York.

Q. Now, what, in your judgment, would be the effect of government ownership or government control that would require all railroads to carry freight for one man at the same price as they carry it for all others, the distribution of population being taken into consideration? A. I think that it would be especially beneficial. It would give individual enterprises that they do not dare to enter under the present system

Q. As I understand you, there is a timidity about building up enterprises in your part of the country for fear of discriminations in favor of some strong company and against the men that are starting new enterprises? A. Yes.

Q. These men are afraid to meet competition? A. Yes; the great, overshadowing fear that men have in the oil country in starting in to compete for the oil trade and the refining business is that the railways will design against them and shut them out of the markets; that is the trouble. If these was a guaranty that everybody would be treated equally by the railways, the men of the oil regions have the courage, the ability, and the resources to go in and do this business.

Q. Now, what has been the experience in your part of the country with regard to the individual farmer marketing his product and the elevator companies shipping the same product from the West? A. We do not have any elevator companies in our section.

Q. No; not in your section; I refer to the elevator companies in Chicago and the West. How does the freight rate from Chicago to New York correspond with that from Pennsylvania to New York? A. Well, from the information that I have gathered on investigation of the subject, the rate from Chicago to New York is sometimes much less than it is from Pittsburg to New York.

Q. That is, the elevator companies and the beef companies can reach the markets in New York for less than the individual farmer in Pennsylvania? A. Yes; I believe that.

Q. Is that a general principle now established with regard to the beef combines, the elevator combines, and all like combines? A. I think it is.

RELATIONS BETWEEN RAILROADS AND THE SOUTH IMPROVEMENT COMPANY RESUMED.

Q. (By Mr. Ratchford.) Did I understand you to say this morning that the South Improvement Company made a contract with the railroad companies in 1872? A. Yes; in 1872.

Q. Was that a contract to transport their product at certain prices? A. Yes; at certain prices; they raised the prices.

Q. Would you care to state those prices? A. I cannot state the prices without referring to the testimony in those cases.

Q. (By Mr. Phillips.) Have you referred to where that testimony can be found? A. I have referred to the sworn testimony.

Q. (By Mr. Ratchford.) Can you state who composed this South Improvement Company? Was it composed of the independent producers and refiners? A. The South Improvement Company was composed of 13 men. Ten of them were afterwards the prime movers in the Standard Oil Company combine.

Q. It appears that the contract to which you refer was not carried out on the part of the railroad company? A. No; publicly it was not. I wish you would let me answer that. That contract was so abhorrent to every idea of American right that the men in the oil regions went into revolt. They would not stand it; they created such an excitement that the legislature took up the question and repealed the charter of the South Improvement Company.

Q. Did the producers bring action against the railroad company? A. There was a settlement of the difficulty at the time, in which the producers, or a committee of the producers, entered into a contract with the railroad company that henceforth there should be no discrimination for or against anybody; that everybody was to have equal rights. I have given the reference to that contract; it is on record.

Q. Is the South Improvement Company still in existence? A. The charter of the South Improvement Company was repealed by the Pennsylvania legislature in 1872, and the company, of course, went out of existence; but as you will note, by referring to my statement, everything that the railroad company contracted to do publicly for the South Improvement Company in 1872 they have since secretly and persistently done for the benefit of the Standard Oil Company. If the South Improvement Company had been allowed to go on, they would have reached a monopoly and controlled the oil business just exactly as the Standard Oil Company, enjoying the same advantages which the railroad companies had contracted to give the South Improvement Company, was afterwards able to do.

THE CASE OF MR. RICE RESUMED.

Q. In referring to the case of Mr. Rice, of Marietta, against the Standard Oil Company, did you say that the railroad companies increased the rate on Mr. Rice's product, charging him an exorbitant price? A. Yes.

Q. And that in doing so they paid a certain percentage of the amount received from Mr. Rice to the Standard Oil Company? A. That is right. Now let me answer that a little further. Rice got the crude oil for his refinery from the Maxburg field, which, I think, is something like 70 or 80 miles from Marietta. Rice had a pipe line and a car. He obtained a rate, I think, of 15 cents a barrel from the Lake road for his car, running it back and forth. He was extending his business, and the Standard Company got after that railroad and told those men that he had to be stopped. When the road went into the hands of a receiver, Daniel O'Day went to the receiver and threatened that unless they would carry the Standard oil for, I think,

10 cents a barrel and charge Rice 35 cents a barrel—I am not quite sure as to these amounts, but I can fix that—they would lay a pipe line and ship all their oil by pipe line to their refineries in Marietta. The evidence shows that the receiver made that arrangement, and out of the 35 cents that Rice paid he turned over 20 or 25 cents in rebates to the Standard Oil Company. It is in evidence; it is on record; it can all be seen.

Q. Do you believe that it was the result of a demand on the part of the Standard Oil Company? A. Yes.

Q. Following that question, now, a little further, have you not stated that the railroad company finally refused to ship Mr. Rice's oil at any price? A. Yes; that was afterwards. Rice extended his pipe line to the Muskingum River, I think, or some river that runs in there at Marietta, and got some flatboats. The refusal to give Rice any rate at all was when he attempted to get his oil into the southern markets.

Q. Do you believe that was also the result of the influence of the Standard Oil Company? A. I have no doubt of it in the world; not the least.

Q. Now, if the Standard Oil Company found it advantageous to get from the railroad company a certain percentage of the money paid by Mr. Rice for his shipment, how could it be advantageous for it to influence the railroad company to give Mr. Rice no transportation? A. The profit of this monopoly has been enormous. The $500,000,000 which it is said they have accumulated is an immense amount of wealth, and they have gotten it by working the railroads to destroy all competitors so that they could force the consumer to pay a large price for their oil. The 25 cents rebate which they got on Rice's oil was only a drop in the bucket compared to the profits that they could obtain by shutting Rice out of the market and selling their oil in Rice's territory.

Q. I take it from that that the company obtained the best conditions they could and that when they could improve them they did so. Is that it? A. The Standard Oil people?

Q. Yes. A. They are always looking out for the Standard Oil.

Q. (By Mr. Kennedy.) Can you state approximately what per cent of the refined oil of this country is turned out by the independent companies? A. We calculate that they are handling about 4 per cent.

Q. Only 4 per cent? A. Only 4 per cent. You know it is an immense business.

Q. (By Mr. Phillips.) That is, taking the Ohio oil? A. The Ohio oil and the Pennsylvania oil and all the different grades.

Q. (By Mr. Kennedy.) Can you state what per cent of the oil you refine is sent into the German market? A. I am not one of the managers of that enterprise. I know that the larger percentage of the oil is exported.

Q. Then, I gather from your testimony that the business you do in this country is done at a loss, and that the companies are enabled to live and make a profit by the advantages they have in the German market; is that so? A. Yes; the independent producers and refiners went into the New York City market to supply the consumers, but the Standard immediately brought the price down there and they hold it down so that there is no profit. I think I am not revealing any trade secrets when I say that the independents have lost money continuously in New York and Philadelphia in their attempt to supply those cities with oil; but the profit which they make in their export business, in their trade in Germany, in which they have an equal show all around, is sufficient to make up those losses and still show quite a favorable earning for the amount of capital invested.

STANDARD OIL COMPANY'S METHODS OF COMPETITION.

Q. (By Mr. Phillips.) How does the Standard meet competition at the different points in the country? Have you any specific knowledge of discrimination against the independent producers at any particular point or points? A. When the independent producers come into a district to sell refined oil the Standard brings the price of oil down in order to try and make them lose money. Another plan which the Standard Oil Company people—I always like to use that word "people" because it is such a hydra-headed concern that if you do not you may not hit the right thing—follow is to intimidate merchants and prevent them using or selling anybody's oil except their own. Of course, I have read of a good many instances of that kind, but I have in mind a special instance. In 1888 I was in the Panhandle of Texas, at Wichita Falls, and bought some land there from a gentleman by the name of W. W. White. He was quite a prominent merchant. He had a large store and fitted out the wagon trains that went over the plains. While I was there he told me of his experience in the oil business. He had been buying his oil from the Standard Oil Company, but one day a man came along with some specimens of oil that were very much finer than any he had been able to get, and the price being satisfactory, he purchased a carload of oil from him. After two or three weeks the car of oil arrived, and the next morning the Standard Oil Company's representative from Fort Worth appeared on the scene and challenged Mr. White's right to buy anybody's oil except theirs, and declared that they would not stand it. He finally threatened to establish a store and run White out of business if he insisted on selling any other oil than theirs. White was a conservative, close-fisted fellow, and, of course, the prospect of having to lose his business was sufficient; and it was settled and agreed that he could sell this car of oil if he would agree not to buy any more of it and to buy only from them.

THE STANDARD OIL COMPANY AS A PRODUCER OF OIL.

Q. Has not the Standard Oil Company become quite a large producer of oil? A. Yes.

Q. They own a very large percentage of the Ohio oil fields which produce what is called the Lima oil? A. Yes.

Q. Did they purchase that after the price of Lima oil had fallen to, say, 10, 15 or 20 cents? A. Yes.

Q. When they entered that field and purchased a large body of it, was it very cheap? A. Yes.

Q. And did they fix the prices? A. I remember that very well. When the first oil was struck in Ohio

the independent people, who were interested in it, went out and found a market for it for fuel and manufacturing purposes, and were enabled to get from 40 to 50 cents at the wells. That is what it would net them after they had paid the expenses of delivering it. Finally the Standard Oil Company reached out after this new field, and by manipulation of the railways they interfered with the independents and got control, and pulled the price of that oil down to 15 cents a barrel. They held it at 15 cents a barrel in Ohio until they broke the hearts of the producers, and then bought nearly the entire country upon that basis.

HOW THE PRICE OF OIL IS DETERMINED.

Q. Is the price of oil now determined by the exchange, or is it fixed absolutely by the Standard? A. I do not remember the date, but it is quite a number of years since Joseph Seep, the purchasing agent, gave notice that the price of oil upon the exchange would not be the price that they would pay for oil, and that they would fix the price for credit balances, that is, what the producer had and wanted to sell, at what the markets of the world would warrant. Since that time the Standard has fixed the price. Often there has been a wide divergence between the price of oil on the floor of the exchange and the price fixed by the Standard Oil Company for credit balances.

STANDARD'S METHOD OF PURCHASING OIL PROPERTY.

Q. You have explained about the reduction of the price of oil in Ohio. Has not the Standard bought a large amount of producing territory in Pennsylvania and Virginia fields, and were not those purchases made at an extremely low price as a rule? A. I think that their policy has been to depress the price of oil and to discourage men who had oil properties and who were loaded with debt until a point was reached where they could go to them and buy up their property. They bought a very large amount of property. It was just before the great rise which occurred after they had bought all the property they could.

Q. What was the date of that? A. I think it was 1896 or 1897. After they had bought all the property they could the market went up very high, as high, I think, as $2.60, and prices remained high for quite a long period. Evidently they had in mind the idea of depressing prices and obtaining this property, but the law of supply and demand will ultimately make itself felt. For instance, the low point at which they had maintained the price of oil had impoverished the producers and stopped their development, and as a result of that long depression the stocks ran down in the storage tanks to 4,000,000 or 5,000,000 barrels. Then that movement in which they fixed a very extreme, fictitious price was begun for the purpose of getting everybody excited and getting producers out into the field to develop new territory and increase the supply of oil.

Q. And did that great advance shortly after the purchase of the territory aid them in paying for it? Did they not advance the price of refined oil also? A. Oh, very largely; very largely. I cannot give the exact figures, but I have them here; I can give the commission the benefit of these figures.

Q. You think, then, that they assessed the world to pay for that property? A. Yes, two or three times over; yes, 40 times over.

Q. When they have bought out pipe lines they have, as a rule, depressed the price of oil? A. Always. I gave that, I am sure, to the commission.

Q. Upon whom would the payment for these pipe lines fall? A. Four or five times more than the amount would come from the producers. I gave the commission a statement as to how they pulled the price down from $1.30 to 53 cents a barrel.

Q. Do you think, then, that when they buy a large amount of property they are enabled to assess the consumers not only in this country but abroad, to pay for it? Is it in their power to do that? A. They practically control the markets of the world and are working them to get all out of them they can.

Q. When they buy out a pipe line at a high price and depress the price of oil— A. (Interrupting.) The producer has to pay for that pipe line many times over.

Q. Has any member of the commission any further questions to ask? Have you any brief statement you wish to make? A. I have nothing further.

Testimony closed.

WASHINGTON, D. C., September 6, 1899.

TESTIMONY OF PATRICK C. BOYLE,

PROPRIETOR AND PUBLISHER OF THE OIL CITY DERRICK.

The commission met at 10:30 a. m., September 6, 1899. Vice Chairman Phillips presided and introduced Mr. Patrick C. Boyle, of Oil City, Pa., who, being duly sworn, testified regarding the oil industry.

THE OIL CITY DERRICK THE ORGAN OF OIL PRODUCERS.

Q. (By Mr. Phillips.) Please state to the commission your name and residence. A. Patrick C. Boyle, Oil City, Pa.

Q. What business are you engaged in? A. Just now I am an editor and publisher.

Q. Of what paper? A. The Oil City Derrick.

Q. You are the editor and publisher of that paper? A. And proprietor.

Q. Who are the owners and stockholders? A. Well, there are five stockholders. I own all of the stock but enough to qualify—all but four shares; there are four other stockholders owning one share each, enough to qualify them as directors.

Q. Are any of the Standard Oil Company interested at present, or have they been, in the Oil City Derrick? A. They are not now and have not been for very many years. I have been the proprietor of the paper for a great many years.

Q. Were they not the original purchasers of the paper before you came into possession of it? A. When I came into possession it was known as the Derrick

Publishing Company, and W. J. Young was manager; that was in 1885.

Q. Was W. J. Young managing it in the interests of the Standard Oil Company? A. Not as I understand it. He did not conduct it in the interests of any particular party, but employed editors, and they printed the news, as other papers did.

Q. Is it not publicly and fully known to be the organ of the Standard Oil Company? Is it not so considered throughout the whole oil field? A. It may be assumed to be the organ of the Standard Oil Company, but it is not. I am speaking of my personal connection with it. From 1879 to 1885 I knew very little about the paper, but up to 1879 and since 1885 it has not been the organ of any special party.

Q. Has there ever been any adverse criticism of the Standard Oil Company in the Derrick? A. Oh, unquestionably; any number of them.

Q. Within the last 10 years? A. Oh, I cannot recall any particular time. Within the last 10 years there has been no occasion for adverse criticism of the Standard Oil Company. There unquestionably would have been if there had been any occasion for it.

Q. Since you have been manager it has always been very friendly to the Standard Oil Company? A. I cannot say that. It is very friendly to the entire oil trade. As the Standard Oil Company is a part or division of that trade, it is friendly to that as well as the other interests.

Q. Has it not been adverse to all the independent movements that have been started since you have been manager and editor? A. No, sir.

Q. And especially to the independent pipe lines? A. Only to those involving an unnecessary outlay of money and a taxation of the producers. It has stood hand in glove with the producers except those who would impose a tax on them for useless service.

Q. Do you consider it imposing a tax on the producers for the refiners and producers to build a pipe line into a given field for their own benefit? A. So long as there was an efficient service already performed at the same cost I should consider it a hardship to have a duplicate.

Q. If you owned a refinery would you consider it a hardship on yourself and stockholders to lay a pipe line to gather oil from the fields? A. We have taken the position that the producer would not be benefited by the duplication of the pipe line, and in that position we have been sustained by the results. Most of the pipe lines erected 10 years ago have never paid a cent in dividends.

WHY THE WITNESS IS BEFORE THE COMMISSION.

Q. You may proceed in your own way to make a statement of whatever facts you have to the commission, but there is one question I will take the liberty to ask before you proceed. By whose solicitation did you come before this commission to give testimony? A. My own.

Q. Your own solicitation. Did you have any conversation with the principals of the Standard Oil Company before coming before this commission? A. None whatever, before or since. I should like to state in way of explanation that it was the outrageous testimony which I had heard here by previous witnesses that impelled me to ask the privilege of coming before you as an observer and as a person in a position to know the facts and to make some statements concerning the oil industry.

EARLY HISTORY OF THE OIL INDUSTRY.

There was an oil business in existence before Drake drilled his experimental well in 1859. The manufacture of shale oil began about 1840 in France, 10 years later in England, and three years later in America. While America was perhaps the latest among the Anglo-Saxon races to embark in the new industry, it made up in enterprise what it lacked in precedence. With the discovery of petroleum in 1859 the coal oil industry of this country within a year or two practically ceased to exist, and plants constructed for the distillation of oil from shale were converted into refineries for the crude petroleum. By this means the refining industry was fully established, when petroleum appeared to claim the attention of commerce. The product, crude from the wells, found a ready market at remunerative prices. Petroleum was produced from gravel beds, salt wells and oil springs long before it was obtained by the artesian process, and a considerable commerce established by Kier, Badger, Ferris, Peterson, Lockhart and others when the Drake well came to increase the production. It was not at once used in the arts, but a demand was found for it among the apothecaries, and for many years it was known to the pharmacopœist as a liniment. Artesian borings were first applied in America by salt producers. At this point I should like to present petroleum in the original package. That is the way it appears. (Presenting small bottles of crude petroleum.) The first is from the Kiers well, and the second is from a well in Kentucky—from the American oil well on the Cumberland River. Prof. S. F. Peckham describes at some length in the Tenth Census reports the process employed by Colonel Ruffner, the pioneer salt-well driller, in 1808. Colonel Ruffner is given credit by this writer for having devised drilling tools not differing materially in form from those now in use. The jars, an essential implement in the oil well driller's outfit, are said to have been devised and first used by Colonel Ruffner, and every salt well borer since his time has laid claim to the use of this indispensable implement. As a matter of fact, drilling tools, substantially the same in form, were employed by the English coal hunters a hundred years before. This, however, does not detract in the least from the credit due to Colonel Ruffner and those who succeeded him with light tools, suspending from the end of a flexible pole, which rose and fell by hand power manually applied. Oil, often in very considerable quantity, was noticed in salt wells, in some of which the flow was so free as to interfere with the operation for brine. The demand for salt, about 1810 to 1814, along the western slope of the Alleghenies from New York to Alabama was so great as to excite adventure in many parts, and salt wells were bored simultaneously in widely separated localities on the Ohio, Monongahela, Allegheny, and Kanawha

rivers and their tributaries in large numbers, and with what might pass for spontaneous effort. Every district so explored has its traditions of oil discoveries, and, singular to say, the later oil developments in almost every instance have been faithfully outlined by the salt wells. In the absence of surface indications, at one time much in demand, all the earlier oil developments were conducted in the vicinity of salt districts, with the single exception of Oil Creek, and here it was found exuding from crevices in the rock or from gravel bed deposits. Rev. S. J. M. Eaton, one of the most intelligent observers among the early writers on oil topics, reports the first shipment of petroleum from the region of Oil Creek to consist of two five-gallon kegs, conveyed to Pittsburg on horseback by a Mr. Carey, one of the first settlers in Venango county. General Samuel Hays, another pioneer settler of Venango county, at a later period purchased the oil product of the county, 16 barrels in all, representing a year's production, which was conveyed to Pittsburg by raft and sold to apothecaries at a dollar a gallon. Previous to 1820 the production of oil from salt wells, added to a somewhat extensive dipping interest at various places in several States, had reached a very considerable amount; so large, indeed, that the supply seemed inexhaustible, and a writer in the Pittsburg Gazette in 1828 agitates the use of petroleum for street lighting purposes.

THE FIRST FLOWING OIL WELL.

The first flowing well anywhere was the famous American well, near Burkesville, on the Cumberland River, in Kentucky. It was drilled for brine in 1829, on the land of Mr. Lemuel Stockton, who passes into history as the first of his race to literally "set the river on fire."

Niles' Register (1829) says: "Some months since, in the act of boring for salt wells, in Cumberland county, Ky., a vein of pure oil was struck, from which it is almost incredible the quantity of the substance issued. The discharges were by floods, at intervals of from two to five minutes between each flow, vomiting forth many barrels of pure oil. These floods continued for three or four weeks, when they subsided to a constant stream, affording many thousand gallons per day."

Another writer says: "The oil found its way into the Cumberland River, was set on fire, and is said to have burned on the surface for a distance of 40 miles below." In 1833 Professor Silliman describes a visit to the oil springs near Cuba, N. Y., and the manner of collecting the oil from the surface of the water. Charles B. Tergo, in his Geography of Pennsylvania, 1843, describes the oil springs on Oil Creek, from each of which from two to ten barrels of oil were collected in the season by the proprietors. In 1845 petroleum obtained from Peterson's salt well, at Tarentum, was experimentally used as a lubricant at the Hope Cotton Factory, in Allegheny. Two years later, Thomas and Samuel M. Kier, deeming the oil more important than salt, set about to find a market for it. A description of his efforts in this direction is set forth in the Derrick Handbook, pages 945 and 947. No one who is familiar with the history of the petroleum industry can withhold from Kier the credit of being the first trader and one of the earliest manufacturers of mineral oil. His efforts in behalf of an infant industry merit more than passing notice, and his contribution to it should be perpetuated in permanent form by a grateful people.

ORGANIZED ATTEMPT TO PRODUCE PETROLEUM.

The first organized effort to produce petroleum appears to have been set on foot in 1853 by Jacob D. Angier, of Titusville. The first recorded lease, the one under which he operated, contained these stipulations, to wit:

"Agreed, this 4th day of July, A. D. 1853, with J. D. Angier, of Cherrytree township, Venango county, Pa., that he shall repair up and keep in good order the old oil spring on land in said Cherrytree township, or dig and make new springs, and the expense to be deducted out of the proceeds of the oil, and the balance, if any, to be equally divided, the one-half to J. D. Angier, the other half to Brewer, Watson & Co., for the full term of five years from this date, if profitable.

"BREWER, WATSON & CO.
"J. D. ANGIER."

The royalty or rental fixed in the above lease served as a model for the oil leases later on, and the terms were adopted to a very considerable extent during the earlier periods of development. Under this agreement Angier proceeded to dig ditches and pits, and in so doing frequently struck pockets of oil in the gravel a few feet below the surface. When the ditches were first opened from four to six gallons were collected per day from the surface of the water, but the labor required to keep the oil flowing consumed the entire profit, and after a few months the experiment was abandoned.

Angier appeared to have been unfortunate only in his location. A slight change of a very few rods north and westward would have brought him to the vicinity of what was subsequently known as the bonanza district, where, in 1877, oil springs were developed at a depth of 15 feet in a bed of gravel confined above and below by a casing of clay, impervious to water, from which, in the course of a very few months, thousands of barrels of oil were obtained.

The next organized effort to obtain oil from the springs was by George H. Bissell and Jonathan G. Eveleth, who in 1854 purchased 135 acres in Cherrytree township, Venango county, from Brewer, Watson & Co., upon which the subsequent experiments of Drake were conducted. Preliminary to the boring of the Drake well a lease, dated December 30, 1857, was effected by and between the Pennsylvania Rock Oil Company, and E. D. Bowditch and E. L. Drake, conveying the same land purchased by Bissell & Eveleth from Brewer, Watson & Co. As the first oil lease under which operations were actually conducted it is worthy of notice. The lease in substance makes acknowledgment of the payment of $1 in hand, then is mentioned the demise and let of the lands, "owned or held under lease by the said company in the county of Venango, in the State of Pennsylvania, to bore, dig,

mine, search for, obtain oil, salt, coal, or other minerals existing in and upon said land, and to take and remove and sell such for the exclusive use and benfit, for the term of 15 years, with the privilege of renewal for the same term. Rental, one-eighth of all the oil collected from the springs in barrels furnished or paid for by lessors. The lessees may elect to purchase the said one-eighth royalty at 45 cents a gallon, but when such election be made it shall remain. On all other minerals, 10 per cent of the net profit. Lessees agree to prosecute operations as early in the spring of 1858 as the season will permit, and the failure to work the property for an unreasonable length of time or failure to pay rent for more than 60 days, the lease to be null and void." By agreement, February 12, 1858, the lease was amended so that 12 cents for every gallon of oil should be payment in full for all rental; the amendment also gave the lessees the privilege of renewal for 25 years.

SUCCESSFUL PRODUCTION IN THE OIL CREEK TERRITORY.

The experimental boring, begun in 1858, was not carried to a successful conclusion till the latter part of August, 1859. The excitement attending the success of Drake's experiment finds a parallel in the gold discoveries in California, to which it is second only in degree and importance. The fact that the oil could be obtained by artesian boring with so little labor and expense was sufficient to create a demand for territory in the vicinity and to inspire others to follow his example. During this and the year following wells were completed in various parts, embracing the entire length of Oil Creek, south of Titusville and extending to Franklin, below its mouth and Tidioute above. The produced oil did not go begging for a market; rather, buyers came begging for the oil. Colonel A. C. Ferris claims to have purchased the first thousand barrels produced from the Drake well, which he distributed among the New York refineries. The early writers, Gesner, Hodge, Redwood, Antisell and others, inform us that the art of refining coal oil had attained to an advanced stage before petroleum was commercially known. Both Gesner and Antisell published lists of patents covering almost every process of manufacture as practiced by the oil refiner of the present day, all known and many of them used prior to 1860. Steam was freely used in distillation and suggestions offered for various processes of continuous distillation. In 1860 Joshua Merrill took out letters patent for a process for "cracking" oil, which demonstrates that chemistry was abreast of the drill, in devising useful methods of manufacture.

TRANSPORTATION AND MEASURES OF OIL.

The one problem left unsolved was that of transportation. The oil district, then 30 miles distant from the nearest railway points, was dependent upon teams for an outlet. Oil was conveyed by wagons from Titusville to Union Mills (now Union City) and Erie, by raft and barge to Pittsburg, by way of Oil Creek and the Allegheny River. Oil refineries rose as if by magic throughout the region. Before the industry had closed its first year there is said to have been upward of a dozen so-called refineries in Erie, 50 miles distant from the fields of production. One of the difficulties met at the outset was the scarcity of packages. The demand for barrels outgrew the supply, and any cask fit to retain fluid was impressed into the service of the oil producer. The unit of measure at the outset being the gallon, sales were made on that basis, therefore the size of the package was not a necessary condition to trade. But later on, when the barrel became the unit, discrepancy in the size of barrels became a matter of embarrassment to the producer. The resources of the seaport towns were drawn upon for coopers, and as a consequence men from the Eastern States were among the first to recognize the importance of establishing barrel works in the new oil fields. The whaling industry, at that time unprofitable, owing to the extended voyages and hardship of the chase, had a fully developed cooperage industry, and mechanics drawn from this trade found employment in the oil-producing country. The capacity of the barrel became a matter of comment among producers about the time of the advent of the whale oil men, who brought casks of enormous size with them, which in periods of surplus production were offered and accepted as ordinary barrels. Therefore the necessity for a uniform barrel was clearly apparent. As the result of these discussions, 40 gallons became the trade-customs barrel for crude oil, and this continued from 1860 to 1866, when representative producers got together and issued the following:

"Whereas, it is conceded by all producers of crude petroleum on Oil Creek that the present system of selling crude oil by barrel without regard to the size is injurious to the oil trade, alike to the buyer and seller, as buyers with the ordinary sized barrels cannot compete with those with large ones, we therefore mutually agree and bind ourselves that from this date we will sell no crude oil by barrel or package, but by the gallon only. An allowance of two gallons will be made on the gaugé of each and every 40 gallons in favor of the buyer."

It will be seen that the barrel by resolution differs from the barrel by adoption only in the addition of two gallons for tare or waste. Later on, after the establishment of pipe lines, buyers began to demand 42 gallons net with the addition of two per cent for tare, which is the accepted barrel of to-day, although the construction placed upon the barrel by the government during the period of excise, April 1, 1865, to March, 1866, was "any vessel containing not more than 45 gallons and not less than 28 gallons." This amount was subject to a duty of $1. The railroads, for transportation purposes, when bulk shipments began, construed the barrel to be 45 gallons, and so it remains, but the barrel of commerce is 42 gallons.

NUMBER OF WELLS IN OIL CREEK REGION PREVIOUS TO 1869.

The development after the striking of the Drake well was necessarily slow, and its history is somewhat obscure. We can do no better than quote from the

Derrick's Handbook, page 788, in regard to this period:

"There is a great deal of uncertainty in the early records of field operations. No systematic effort at collecting the statistics of rigs, drilling wells and completed wells was made, except by spasmodic efforts now and then, until May, 1875, when the Derrick commenced to publish its regular monthly report of oil developments."

On November 21, 1860, the Venango Spectator published a report containing the names and location of 74 producing wells in the Venango oil region. These wells had a combined daily production of 1,165 barrels, and were distributed from the head of Oil Creek to its mouth and along the Allegheny from Tidioute to the Hoover well, three miles below Franklin. In this report the output of Drake No. 1 is given as 12 barrels, and No. 2 at 30 barrels a day.

A year and a half later, May 18, 1863, the Oil City Register made a careful estimate of the entire field and gave the results as follows: "Number of producing wells, 75; number of wells that had formerly flowed and pumped, 62; wells drilling, 358; total, 495."

On January 1, 1869, according to Cone & Johns, in Petrolia, there were 1,186 producing wells in the region. About 150 of these wells produced less than two barrels. There were 200 of which the production was less than five barrels a day. Of the entire number on the producing list, 724 were completed in 1868 and the remainder during the preceding years, as follows: 1867, 148; 1866, 92; 1865, 90; 1864, 46; 1863, 29; 1862, 20; 1861, 17; 1860, 10; 1859, 1.

The total number of wells drilled in the region from 1859 to 1869, as given by Henry E. Wrigley, in the Second Geological Survey, was 5,560. This would show that 4,374 wells had been completed and abandoned as dry or unprofitable during the first ten years of the industry.

Before the closing of Professor Wrigley's report the oil business had become firmly established and thoroughly systematized in all its departments.

FLOWING WELLS AND THEIR DISASTROUS EFFECTS.

At the close of 1869 fully 500 teams found employment in the transportation of oil from the wells and the movement of supplies, in addition to the flats and barges employed on the creek and river to the number of 100 or more. In 1861 flowing wells appeared to vex the producer and embarrass the trade. The first flowing well, which was also the scene of the first tragedy in connection with oil development, was struck in April by Little & Merrick, on the John Buchanan farm, Rouseville, three miles above the mouth of Oil Creek and 12 miles below the Drake well. The sight of a flowing well was so unusual as to attract many spectators, who crowded about the derrick to the number of some hundreds, and while they were looking on in amazement at the phenomenon before them, fire was communicated to the floating gas by a nearby boiler, when a terrific explosion occurred, and in the resulting fire 17 persons lost their lives, among them being the Hon. Henry R. Rouse, ex-member of the legislature and one of the leading spirits in the oil development.

In June following, the Funk well, about midway between the Rouseville and the Drake wells, began to flow, and in September of that year Phillips & Co. No. 2 on the Tarr farm, about midway between the two flowing wells, began to gush at the unheard rate of 4,000 barrels a day. In December the Woodford well, 400 feet from Tarr No. 2, was flowing at the rate of 3,000 barrels a day. The effect of the flowing wells upon the oil trade was little short of disastrous to the small producers, and for the time being were not a little embarrassing to the owners thereof. The scarcity of barrels and the absence of tankage made it extremely difficult to save the oil, but as fortune would have it, all these flowing wells were located on the bank of Oil Creek and the barges became available to store the surplus production. One of the effects of the enormous production was to smash the market, which, at the close of 1860, was not very strong, having declined from $20 a barrel in January to $2 in December. January, 1861, prices opened at $1.75; the market continued to soften until the advent of the gushers, when it went off to nominally nothing, 5 and 10 cents a barrel being offered.

The condition of the trade at the close of 1861 was very much worse than it was at the beginning, and this period, owing to overproduction and the political disturbances due to the opening of the rebellion, was one of the worst known in the history of the business. One of the results of the flowing wells was to create a corner on the oil barrels, coopers refusing to sell except for cash, and the value of a barrel at this time expressed in terms of oil was 20 to 1.

CONDITION OF THE INDUSTRY IN 1862—CONSTRUCTION OF THE FIRST PIPE LINE.

Unremunerative prices checked production, and the spring of 1862 witnessed a gradual rise in the price of oil. The suspension of specie payment and the rapid advance in the price of gold caused a general advance in the values of all kinds of commodities. Petroleum was in good demand and better prices began to prevail. Oil at the wells rose from 10 cents a barrel in January to $1 in June and $2.50 in December. The most reliable estimate of the average for the year is $1.05 per barrel.

The development work in 1862, while not large, was exceedingly important in the discovery of large wells. Operations for the most part were confined to the Upper Allegheny—that is, Tidioute, Oil and French creeks. Smith's Ferry, 100 miles in a bee line from the Drake well, marks the first important extension of the oil development. The cost of sending a barrel of oil to New York from the producing field in January of this year was $7.45; the cost of delivering a barrel of oil in Pittsburg by steamboat, $2; teaming from Oil Creek to Meadville, $2.25. The producers, appreciating by this time the value of good resolutions, held a town meeting and resolved to sell no oil at less than $4 per barrel.

A bill was this year introduced in the legislature for a pipe line from the upper oil farms to the mouth of the creek. A charter was granted under the title of

the Oil Creek Transportation Company to carry oil in pipes or tubes from any point on Oil Creek to the mouth or to any point on the Erie Railroad. No line was built.

In March of this year the first shut-in movement for the betterment of prices was inaugurated, owing to the stagnant condition of the trade. Stopcocks were turned on the wells, production ceased for a considerable period, and the movement was carried to a successful conclusion. Congress during this year imposed a tax of 10 cents per gallon on refined oil and proposed to tax crude oil 5 cents per barrel; but the producers, conscious of the power to be attained by uniting, held a town meeting in Titusville, where resolutions were adopted and Congress petitioned to lay a tax on refined oil only, and for the benefit of refiners recommended a drawback on all oil exported to foreign countries. Congress assenting, laid a tax of 10 cents a gallon on refined oil and absolved the producer from any levy whatever.

The first successful pipe line was constructed during this year by J. M. Barrows, to convey oil from the Densmore wells on the Tarr farm to his refinery, distant about 1,000 feet. This was the first pipe line, "correct in principle and successful in operation."

About the same time a pipe line two and one-half miles long was constructed from Tarr farm to the Humboldt refinery. Cast iron pipe with lead joints was used as a conduit. Great loss resulted from leakage at the joints. After an experiment of some months' duration, the loss from this source proving greater than the cost of transportation by team, the enterprise was abandoned, and no other attempt was made to solve the great problem of hydraulic engineering until Van Sickle's experiment, 2½ years later. Railways were extended into the region this year—the Oil Creek road south from Corry to Titusville and the Atlantic & Great Western eastward from Meadville to Franklin. By means of the latter the Cleveland refining interest received its first great impulse, since it was possible to receive oil by rail direct from the wells without trans-shipment, and the advantage thus derived gave them a trade position later on which was practically impregnable.

On the other hand, Samuel Downer, availing himself of the advantage of rail transportation, located an oil refinery, the largest of its day, at Corry, a point most admirably adapted because of the facilities afforded by two competing railroads.

DEVELOPMENTS IN 1863 AND TRANSPORTATION BY BOATS.

The production of the large wells had greatly declined and the total yield for 1863 was hardly one-half that at the beginning of 1862; developments throughout the year did not materially add to the production. The development work of the year was neither large nor important, though not entirely lacking in sensational features, as attested by the striking of the Noble and Delamater well on the Farel farm, Upper Oil Creek, which started with an initial production of 3,000 barrels, and maintained an average of 1,000 barrels per day throughout the year. This was followed in midsummer by the Maple Shade well on the Hyde and Egbert farm, which started with an initial production of 1,000 barrels per day. During this year the pond fresh obtained its highest development. A conservative estimate of the number of boats plying on Oil Creek at this time would be 300, and upon the Allegheny River 700, making a total of 1,000 boats employed in transporting oil.

The pond fresh was unique in that it was an artificial flood, made by confining the water in several days, all of which were cut at a given time, letting out vast quantities of water and creating a boating stage that continued from two to three hours, during which hundreds of boats would float out with the tide and reach the Allegheny River. The pond fresh had its days, when water was comparatively plentiful, as many as two a week would be arranged when water was plentiful, but during the dry season it was generally limited to one—Friday usually being the day selected. It was not unusual for 20,000 to 60,000 barrels of oil to pass out of the creek upon one of these artificial freshets. If a source of convenience to the trade it was also a source of annoyance because of accidents occurring to boats and the consequent loss of oil. A careful writer has estimated that fully one-seventh of the oil produced was wasted by the oil freshets, leaky barrels, etc., which loss, as a rule, was incurred by the shipper. The pond freshet was a source of considerable expense to shippers and boatmen, and to meet the cost of creating the artificial rise a tax upon the boats or oil shipments was levied by an agent of the mill men who controlled the water. The method of collecting the tax, though somewhat simple, was exceedingly laborious, an agent passing along the creek from point to point making the collections before the boats started. It frequently occurred that when collections were difficult the fresh was delayed often as much as a day.

The fall of this year was exceedingly dry, and the mill men, taking advantage of it, raised the price of water upon shippers. The difficulty in making collections at this particular time caused the insertion of the following notice in the Oil City Register, October 29, 1863, signed, A. S. Dobbins, superintendent:

"A statement in regard to the cost of a pond fresh in dry weather, or when all the dams are needed, may be interesting to those who have to pay for them, and will serve to explain why 4 cents per barrel per pond-fresh tax is charged this season instead of 2 cents for the same purpose last season. I here give the cost of the dams and other necessary expenses of the pond fresh this year: Kingsland's dam, $200; Pearson's dam, $12; Stanton's, $20; Childs, Benedict & Rouse's, $20; Tallant's $5; Newton's, $20; Langworthy's, $7; Tryan's, $20; Lyttell's, $10; Hide Creek, $29; for superintendent's horse, expenses and hire of the two men to cut dams, one on each creek, $40; thus making a total of $383. All these dams cannot often be had, as their owners will not set them up for us. In dry weather Mr. Benedict will not cut his at any price, hence we cannot get the Rouse dam, which is right above it. In dry seasons a freshet cannot be had every week, and if the superintendent spends a week or two extra between freshets collecting along the creek, this must be added to the expense. So that in some cases a fresh actually costs $400. The same dam which we

now pay Mr. Kingsland $200 for cost us in the early part of last season but $55, and at no time during the summer of 1862 over $100. Other owners of dams have raised their prices, but not in the same proportion. The rise in the price of oil and the railroads at Titusville and Franklin have greatly diminished the amount of oil run out of Oil Creek. While the cost of a pond fresh is fully as much as last year, the amount of oil shipped is fully one-third less. During the prevalence of the smallpox and cholera scare it was impossible to collect the tax; and then many boats run through to Franklin without stopping, and they 'haven't stopped since.' This leaves us with a debt of nearly $800 to commence the coming season."

Transportation by teams and boats received their first effective blow by the completion, that year, of the Atlantic & Great Western Railroad to Franklin, and the Oil Creek from Corry to Titusville.

CONDITION OF THE OIL PRODUCING INDUSTRY IN 1864.

During 1864 the Oil Creek developments were extended to Upper Cherry Run, and there was great excitement over oil in all parts of the country. It was the beginning of the era of oil stock companies and every part of the known oil region was purchased or leased by them. In July, 1864, the Reed & Criswell well, on the Reed lot, Cherry Run, was struck and flowed at from 280 to 300 barrels a day. A quarter of the land interest in this well was sold for $280,000, and the first purchasers realized nearly $1,000,000. Oil in July sold as high as $13.75 per barrel. In this year the export trade began to assume large proportions, and the total shipments of refined oil abroad amounted to nearly three and one-half times as much as was sent abroad in 1863. Prices reached the highest point this year since 1859 and 1860 and have not been paralleled in the history of any succeeding year. Starting at $4 per barrel in January, values rapidly appreciated until July, when some sales were made at $14. There was afterwards a falling off which carried prices down to $6.50 a barrel in October, but this was followed by another rally, and the year closed with oil bringing from $10.50 to $12.

In July, 1864, the Oil Creek Railroad was completed from Titusville to the Schaffer farm. There was an active demand for lands along the Clarion River, but the experimental wells were all failures.

COST OF DRILLING WELLS IN 1864.

Drilling extended to the hill slopes and hilltops during 1864, and the use of machinery for drilling purposes became more general. The cost of drilling a well to a depth of 600 feet at this time, as given by Eaton, page 125, is as follows:

Forty feet of metal pipe, at $6 per foot	$ 240
One engine, 10-horse power	1,600
Band wheel and belting	125
One set boring implements	325
Derrick, complete, bull wheel, etc	100
600 bushels of coal at 50 cents	300
Drilling, 600 feet, at $2.50 per foot	1,500
600 feet of cable and sand-pump rope	100
Total	$4,290

SPECULATION AND AMOUNT OF CAPITAL INVESTED IN THE BUSINESS.

It is difficult for the average mind, unfamiliar with dealings in speculative interests, to appreciate the magnitude of the oil business at the time. The capital represented was greatly in excess of that necessary to produce the results attained on the side of production. Speculation had become such a prominent feature of the business that the most extravagant prices were offered and declined for desirable producing properties. The same is true of the refining branch of the business, which was so enormously remunerative, transportation alone being unaffected by the spirit of speculation. John W. Forney is authority for the statement, made by Governor Curtin at Titusville, on the occasion of a visit to the oil region this year, that "4,000 teams were employed in the transportation of oil and supplies in the oil fields, and that 1,000 boats, employing from 2,000 to 4,000 men and as many horses, found employment upon the creek and river."

The capital invested in teams and paraphernalia, reckoned at the prices ruling for this time, namely, $600 per outfit, amount to the enormous sum of $3,000,000. Adding to this $3,000,000 for the 1,000,000 oil barrels required to handle the product, estimated at the ruling price of $3 each, there would be a sum total of $6,000,000 embarked in the single feature of transportation. In the above I have averaged the barges with their outfits as equaling in value the price of a team of horses and its outfit. The average production for the year did not greatly exceed 6,000 barrels a day, and had reached the full limit of the existing transportation facilities. That is to say, if production had increased at this time beyond the capacity of the teams and boats to haul the product to the market, oil would have backed up at the wells, gone into permanent storage or to waste. The capital engaged in transportation would have purchased the entire production of the region at $1,000 a barrel, a sum greatly in excess of the cost of production. In other words, transportation had so fully kept pace with field developments that the cost of moving a barrel of oil to the river or railroads exceeded that of producing it.

IMPORTANT EXTENSIONS IN THE OIL FIELDS IN 1865.

This tax has to be deducted when figuring what was actually realized by the producers for their oil at the wells. Starting at $10 a barrel in January, the lowest point, $4, was reached in August. After that there was an advance to $9.50 in October, but the year closed with oil at $5 a barrel. The statisticians of the New York financial journals placed the average realized for oil in 1865 at $4.27 in gold, and $6.61 to $7 in currency. At New York the average price for refined for the year was 87½ cents per gallon. The Columbia Oil Company realized $6.65 per barrel for their product during the first half and $5.87 for the latter half of the year 1865. Their average for the year was $6.18. It is well to recall that these are quotations along Oil Creek, and that a tax of $1 a barrel had to be paid from the producers' receipts. Oil at Pithole sold as low as

$2.50 per barrel in August and $4.50 to $4.60 in December. It was not unusual previous to the establishment of pipe lines to find a difference of 50 per cent between the ruling prices on Oil Creek and those at the wells at Pithole, the difference being due to the cost of transportation.

IMPORTANT IMPROVEMENTS IN 1865.

In many respects 1865 stands forth as the red-letter year in the oil business. During this year casing was introduced, by which the life, so to speak, of an oil well was greatly prolonged, as well as its production materially increased, by permitting the free escape of gas in such manner that it could be utilized for fuel purposes in the production of steam. Tank cars appeared on the railroads, due to the inventive genius of the Densmores, admitting of bulk shipment for the first time by rail, and dispensing with the cumbrous barrel, which had proved both an incubus and an embarrassment to the trade. There were sundry improvements in drilling; a notable increase in the weight of the tools; the torpedo appeared as an aid to production, upon the appearance of which the crevice searcher, sand scraper, volcano burner, steam injectors and various other devices for increasing production disappeared. The cylinder gas pump came into limited use this year, displacing the rotary gas blowers and atmospheric injectors previously in use. The use of benzine as a dissolvent for paraffin was beginning to attract public notice. Careful observers estimate that in the five years ending 1870 a million barrels of benzine went into oil wells to dissolve paraffin, came out as crude oil, and was sold back to the refiners at an advance of 300 and 400 per cent on the original cost.

Shippers eventually were compelled to apply a gravity test upon all oils to protect themselves from the benzine habit, and for many years high gravity oils, now so much in demand, were not considered a good delivery at export points. I think the limit of gravity was placed at 48°. Oils above 48° were not a good delivery at export points.

The increase in the refining capacity during 1864-65 was a matter of very general comment throughout the region. Eaton estimates that there were 90 refineries in the oil region, with a crude capacity of 18,000 barrels a week, costing on an average $10,000 each. The whole he roughly estimated at $1,000,000 in value.

PROGRESS IN THE CONSTRUCTION OF PIPE LINES.

The successful pipe line was completed during this year, the Miller Farm line, using force pumps to deliver the product at a railroad point five miles distant. About the same time the Pennsylvania Tubing Transportation Company completed a gravity line from Pithole to Oleopolis, on the river. Both were successful and well patronized. The effect was to reduce the cost of delivering oil to shipping points from $2 and $3, according to the condition of the roads, to a uniform price of $1 a barrel, the fixed price established by the pipe lines. Within a year five lines centered in Pithole, competing for a business scarcely sufficient for one, namely, the Miller Farm Pipe Line, the Pennsylvania Tubing and Transportation Company (later known as the Rochester and Oleopolis Pipe Line), Pickett & Sherman's Titusville Pipe Line, John Warren & Bros.' Pipe Line to Henrys Bend, and Smiley & Coutant's gathering line about Pithole. When pipe lines were first established they did not reach out for the producers' wells, but established a tank at a fixed point, called a "dump," at which the producer was obliged to deliver his oil in barrels. Smiley & Coutant's line was the first to connect with the producers' wells and its function was limited to delivering the producers' oil to the dump tanks of the pipe lines. Later on they sold their gathering system to the Titusville Pipe Line and from that time forward the pipe lines were extended to the producers' tanks and gathered their oil on their own account. The tariff charged for gathering this oil by Smiley & Coutant was 25 cents a barrel, being slightly below the cost of delivery by team in barrels.

I want to call your attention especially to the following fact: It has been stated before you that piping the refined oil is a recent thing. During this year, 1865, refined oil was successfully transported by pipe lines a distance of three miles by John Warren & Brother from Osceola refinery, at Plummer, to McMahons Run, on the Allegheny river, near Oleopolis.

The following year Vandergrift & Forman's Pipe Line put in an appearance and made the sixth pipe line competing for business in the Pithole watershed.

Commenting upon the pipe line system, just then introduced, the Pithole Record, in its issue of October 16, modestly says: "One of the most wonderful of the many wonders produced at Pithole is the oil pipe running from the United States well to the Miller farm, on Oil Creek, a distance, on an air line, of about five miles. The pipe is two inches in diameter and lies most of the way on top of the ground. Three pumping engines are stationed along the route, forcing the oil through the pipe at the rate of about 80 barrels an hour, doing the work of about 300 teams working 10 hours a day. This machine can work all day and all night. This was considered experimental, but proved a decided success. The 6-inch pipe line laid from Pithole creek to the Island well, distant 7 miles, by the Pennsylvania Tubing Company, is likewise a success."

COST OF TRANSPORTATION IN 1865.

The cost of moving a barrel of oil from Pithole to New York in December, 1865, was $5.55, to wit: Pipe transportation from Pithole to Miller farm, $1; barreling, shipping, etc., at Miller farm, 25 cents; freight to Corry by the Oil Creek Railroad, 80 cents; freight from Corry to New York, $3.50. Cost of delivering a barrel of oil to New York by the way of Pittsburg: Transportation charges by pipe from Pithole to the river, $1; freight on river to Pittsburg,

$1.50; wharfage, loading, etc., at Pittsburg, 25 cents; freight from Pittsburg to New York, $2.44; total, $4.59; difference in favor of Pittsburg route, 56 cents.

The price of moving a barrel of oil from any part of the region to the seaboard to-day is 50 cents or less, owing to the existence of pipe lines, the price for rail and pipe being the same since 1879.

THE PRODUCTION AND PRICE OF OIL IN 1866.

The tax on crude oil was repealed in May, 1866, but it did not stay the downward tendency in prices. Production had been increasing under the impetus of higher values and the daily yield for the winter of 1866 was at least 12,000 barrels. By May this had largely declined, owing to the falling off in the output of the wells at Pithole, and prices again began to strengthen, but the collapse of numerous oil companies and the general scare over the bursting of the great oil bubble exercised a depressing influence. The Columbia Oil Company's statement (we have a good deal to say about that company, because it is the only company that has been in existence constantly from the beginning of the oil business to the present time; their prices were given at stated periods and they were producing continuously from 1861 to 1890) shows sales at $1.65 to $5, and an average price of $3.78 per barrel for the year. Another good strike was made at Brady's Bend this year, promising the opening up of new territory in that section.

RAILWAY TRANSPORTATION AND BANK FAILURES.

Railways were now in general operation throughout Venango county, and the beginning of increased shipments of oil by rail is to be noted. The railroads and the pipe lines eventually superseded the water transportation of petroleum down the Allegheny River. At the beginning of this year the Oil City & Pithole Railroad was ready to carry freight from Pithole to Oleopolis. The failure of the banking house of Culver, Penn & Co., the prime movers of which were interested in financial institutions throughout the oil country, caused great excitement and the closing of several of the smaller banks. Among them were the Petroleum Bank, Venango County Bank, Crawford County Bank, and Cotton & Co.'s Bank, located at Oil City, Meadville, Titusville and Petroleum Center.

Q. (By Mr. Phillips.) Were these banks all under the control of Culver, Penn & Co.? A. They were supposed to be under the control of Culver, Penn & Co.

Q. They, therefore, did not affect other banks so as to cause failures? A. But Culver, Penn & Co. were so closely identified with the oil interest at this time that it seemed to affect it at every point.

LOSS OF OIL BY FIRE—INCENDIARY.

In April, 1866, the oil tanks of Henry Harley & Co., at Shaffer, which received the oil from Benninghoff Run, two miles distant by pipe line, were set on fire by an incendiary mob, composed, it is said, of teamsters, who had been thrown out of work by the construction of this and other pipe lines. Four Oil Creek Railroad cars, with two tanks on each, together with pipes, platforms and about 1,000 barrels of oil, were burned. In July, 1866, the Titusville Pipe Company perfected arrangements whereby oil shippers could have their product shipped direct to New York by the Empire Line, the pipe line lading bill answering for the entire distance. The effect of that innovation by the Empire Line, 1866, was to make one rate on the oil from the well to the seaboard or refinery, a matter which caused a great deal of discussion later on between the shippers, producers and railroads. The Oil City Register estimated that the loss of oil by fire during the first six months of 1866 amounted to 70,000 barrels. The Warren and Franklin Railroad was completed to Oleopolis, where it connected with the Oil City and Pithole Railroad. It was noted that Professor Hamar, in July, 1866, successfully exploded a torpedo in a well on the Tarr farm, which is reported to have brought the well up from nothing to 300 barrels.

CONDITION OF THE INDUSTRY IN 1867.

The year 1867 proved another one of low prices and general depression owing to overproduction. Dennis Run and Triumph Hill, near Tidioute, with Shamburg and Scrub Grass, were added to the producing area this year. The advent of railroads and the established success of the pipe line system had greatly improved the methods and lessened the cost of oil transportation. Pipage charges from Benninghoff Run to Shaffer were 50 cents per barrel; Pithole to Titusville, 50 cents; Bull Run to the Miller farm, 45 cents.

West Virginia had assumed some prominence as an oil field, and the daily production of the various fields was reported in January as follows: Burning Springs, 500 barrels; White Oak, 200 barrels; Sand Hill and Horse Neck, 100 barrels; lubricating oil district, 100 barrels a day.

Q. The first production was at Burning Springs, on the Little Kanawha, and was for many years confined to that region? A. The first was at Burning Springs; that is, the first actual operations were there; but almost contemporary were the operations on Duck creek in Ohio.

Q. But both these fields ceased to be any factor? A. They ceased to be any factor from 1861 to 1867. In 1867 there was an increase. They came into prominence then through the operations in the vicinity of Newells run and Cow run in Ohio. The production had not entirely ceased at any time on Duck creek.

In March, John Ponton published his much-abused pamphlet on the Crisis in the Oil Region, in which he figured the stock of oil in the United States on March 10 to be 386,105 barrels; in Europe, 325,000 barrels; a total of 711,105 barrels. He figured the foreign and home consumption of oil during 1866 at 8,577 barrels per day, and declared that it would require a net daily production of 11,237 barrels to supply the probable demand of the year. The production he placed at about 6,000 barrels a day, showing a deficit of over 5,000 barrels.

At an estimated value of $2 a barrel for crude oil for that period Ponton proceeded to demonstrate by figures that the production of oil was a losing business. He went into figures showing the cost of producing or lifting oil by gas on an estimated value of $3,500 a well, and was able to show a profit of $504 by the use of gas that cost nothing; by the use of coal, at 50 cents a bushel, he was able to show a loss of over $1,500 to the producer at existing prices; with wood fuel, at a cost of $10 a cord, there was a loss of upward of $1,000.

HIGH COST OF FUEL IN THE OIL REGION.

Q. Will you state why fuel was so high at that time? From where was the coal supplied? A. The high cost of fuel was owing in very great part to the difficulties in teaming. Coal was procured from various places.

Q. But largely from Pittsburg? A. Largely, and from points on the Allegheny river.

Q. There was no coal produced in the immediate oil field? A. Not on Oil Creek; the nearest coal to Oil Creek was at the Cranberry mines, four miles south of Oil City and substantially twenty miles south of the Drake well.

Q. A very large number of people think that coal and oil have some connection; I bought it up for that reason; there is no coal overlying the original oil fields? A. There is no coal overlying the original oil fields, but, with the completion of the Jamestown road, the coal was brought in from the Jamestown fields at a very much less cost.

PROFIT AND LOSS IN THE PRODUCTION OF OIL.

I will read an extract from John Ponton's A Crisis in the Oil Region, 1867:

"The cost of sinking wells at the present time is less by from $2,000 to $3,000 than it used to be when new engines and machinery had to be bought and labor was more expensive With second-hand machinery the average cost of sinking a well is $3,500; very rare instances occur where men have been fortunate enough to put down their wells for $2,500, while in other cases it has cost $6,000. We will, therefore, take $3,500 as the average. From accurate statistical information it has been ascertained that upward of 50 per cent of all the wells that have been sunk in the region have produced no oil; this is an actual loss of capital to the extent of $350,000 in every hundred, and the hundreds of wells yearly put down will give an idea of the exhaustion of the life principle of the region. Of the producing wells, 14 per cent are under five barrels, and three-fourths of the oil is obtained from wells under thirty barrels per day. What is meant by a 30-barrel well is one which produces 210 barrels per week. This class of wells sometimes pump 40, 50, and even 60 barrels when running, but as they are constantly breaking down they average only 30 barrels per day.

"About 50 per cent of this class of wells use, in some cases partially, in others totally, gas for fuel; the other 50 per cent use wood and coal. In nearly every instance one-half the oil goes to pay the land interest; this reduces the supply to 15 barrels per day. Now the aerage life of wells does not exceed six months, and we shall see whether or not it is a paying business.

"The average daily cost of running a 30-barrel well by gas, coal, and wood, is as follows:

BY GAS.

Two engineers, at $3	$6.00
Waste oil and repairs	2.00
	8.00
By 15 barrels of oil at $2	30.00
Deduct expenses	8.00
Surplus to pay back capital	22.00
$22 per day for 182 days or 6 months	4,004.00
Original capital invested	3,500.00
Profit	504.00

BY COAL.

Two engineers, at $3	6.00
Waste oil and repairs	2.00
Seven-eighths ton coal, at $12 delivered	10.50
	18.50
By 15 barrels oil, at $2	30.00
Deduct expenses	18.50
Surplus to pay back capital	11.50
Original capital invested	3,500.00
$11.50 per day for 182 days or 6 months	2,093.00
Loss	1,507.00

BY WOOD.

Generally $2 less than coal	16.50
By 15 barrels oil, at $2	30.00
Deduct expenses	16.50
Surplus to pay back capital	13.50
Original capital invested	3,500.00
$13.50 per day for 182 days, or 6 months	2,457.00
Loss	1,043.00

"These figures clearly prove that the present low price of oil has a direct tendency to destroy the entire oil production of the territory, and not only is the capital of the country becoming rapidly exhausted, but, owing to the reckless speculation in lands in the years 1864 and 1865, hereby it is supposed over $100,000,000 were withdrawn from other

useful occupations in the United States and lost, it has become a practical impossibility to induce capital to return to the region for the purpose of development. The class of men who have during the past year been instrumental in developing the territory were not men of capital. One would put in his labor, another supply an engine, a third build the derrick, a fourth supply the tools, a fifth the fuel, etc., dividing the proceeds into shares or interests. It is almost unnecessary to state that the bitter experience of the past few months has made them sadder and wiser men. In fact this process of development has become almost extinct. The development of the territory is now left to those parties who have been successful in making large strikes, and to land interest.

"It is a very significant fact that the chances of striking large wells are becoming less, in a ratio that is, to say the least, truly alarming. The 1,200 and 1,400 barrel wells of 1865 were replaced by 300 and 400 barrels in 1866; and at the present time a man who strikes a 100 or 200 barrel well may be considered to have realized the extreme of success. If this diminution takes place in the future in the same ratio, a 30 or 40 barrel well will be considered at the close of this year as much the extreme of success as a 200-barrel well is today, and those parties upon whom we now depend for development will, if they do not receive a proportionately remunerative price for their oil, become actually ruined with those upon whom we depended for the production of last year.

"Our philosophers will look wise and say that the law of supply and demand will regulate itself, which is certainly not true in this case; but, even supposing it to be so, if the law of supply and demand takes so long to regulate itself that before that much-to-be-desired end is accomplished we must ruin our capitalists, reduce our mechanics to the brink of starvation, and deplete the territory of its inhabitants, it is high time that we take the supply into our own keeping and give it only to those who are willing to pay a remunerative price for the same."

In this connection I will say that this refers to 1868, but, owing to the general improvements in the means of transportation and the decline in prices of oil machinery and the uniform success in drilling operations, that year proved highly prosperous to all concerned. Large casing was introduced for drilling operations during the year, and to some extent in the year previous; it enabled the driller to have a dry well clear to the bottom, and water could enter it to no very considerable extent.

Q. Will you state what the casing was put in for? A. It was use to exclude fresh water; it was put in at what would be considered the lowest point of fresh water supply—the mountain sand as we call it. That was the point below which no fresh water was found, and salt water was not considered so detrimental to the wells and no provision was made against it. The casing was used to control the water.

CONDITION OF THE INDUSTRY IN 1868—REPEAL OF THE WAR TAX.

The Armstrong and Clarion fields began to attract the attention of oil operators, but the greater part of the oil developments during 1868 were confined to the older sections of the region. The improved methods of transportation were gradually placing the industry on an entirely new basis. In January the Titusville Herald estimated the production of the region at 11,035 barrels a day, with 182 wells drilling. On February 3, a convention of Oil Creek oil refiners was held at Petroleum Center and resolutions passed demanding that the tax on refined oil be repealed. The production was greatly in excess of the demand, and the price had consequently declined below the cost of placing the refined product on the market. On July 1 the production for the month of June was reported at 11,229 barrels a day, with 200 wells drilling. On July 16, 1868, Congress passed a bill exempting petroleum and its products from taxation. Refined oil at this time was subject to a tax of 20 cents a gallon.

Q. What was the tax on crude oil levied by the government? A. One dollar a barrel, and it existed practically a year.

Q. That tax ruined quite a large number of small producers, did it not, who were not able to pay such a tax? A. The government war tax on crude petroleum of $1 a barrel, which remained about one year, worked very unequally, because small producers could not afford to pay it, whereas if a man struck a very large well, 500 or upward, he could afford to pay it. A large number of farms that were only capable of producing from 10 to 25 barrels a day could not be operated, whereas farms adjoining them having a larger producing capacity would drain the other farms. It operated very unequally? A. My answer to that would be that the period of taxation on the oil was three or nearly four years, but it was repealed on the refined. There certainly were a great many failures in that period, but coexistent with them was the bursting of the oil bubbles—a great number of companies that started at that time. There was so much disaster that it is difficult to tell what was the cause of it. I can not say that I know of any producing well which was ever stopped on account of the tax; but my knowledge extends to hearsay only, as my experience does not extend back that far. I went to the oil country the year the tax was repealed on crude oil.

Q. (By Representative Livingston.) Why was the tax levied? A. It was an excise war tax.

Q. What is the tax on oil now? A. There is no tax.

Q. Why not? A. That is beyond my knowledge. There is no tax on any manufactured products except whisky and cigars and tobacco of which I know.

Q. If you should levy a small tax on oil would it not be a good source of revenue? A. It would be

a source of revenue, but it would be bad for the oil interests.

Q. Would it be good for the people who burn it? A. It would be bad for the consumer; the price would follow. The subject of levying a tax on oil was pretty thoroughly discussed in Congress.

COST OF FUEL IN OIL REGION RESUMED.

Q. (By Mr. Ratchford.) In one of the papers you read it is stated, I believe, that coal delivered was $12 a ton for a certain time. What date was that? A. The figures, as stated, I read from Ponton's Crisis in the Oil Regions, 1867.

Q. Are you prepared to state what the cost of crude oil was at that time? A. I have just read that, by pipe line at that period, the cost from Benninghoff run to the Shaffer farm, a distance of two miles, was 50 cents a barrel. From Pithole to Titusville, a distance of ten miles, the rate was the same.

Q. Now, I should like a comparison between the cost of coal, oil, and transportation at that period and their cost at present. What is the cost of coal today? A. There is no consumption of coal in that region today for the purpose then used. They use gas engines. There is oil produced in the same locality, but there is no consumption of coal except to a very limited extent.

Q. What does it cost where it is used? A. About $2 a ton delivered at the wells.

Q. A reduction of $10 as compared with the other period. What is the cost of oil per barrel? A. About $1.37.

Q. Does not that show that the reduction in the price of oil has not equaled the reduction in the price of coal? A. If the commission will indulge me, I should like to answer by a little explanation. At the time to which you refer, 1867, coal at the mines did not exceed $2 a ton and the difference was made up in transportation. There were a great many transfers to the boats and each transfer added cost and the teamsters charged enormous prices for hauling a little coal. A load of coal might be anywhere from 500 to 800 pounds, or three loads to the ton, and they charged $2 to $2.50 a load. I am speaking of conditions that would make the rate that.I am quoting a writer of that day, a man that has a considerable reputation as a statistician. He was a newspaper editor at the time. I am giving his figures.

Q. I asked these questions because it is claimed by the friends of the oil producers, particularly the Standard Oil Company, that the reason for the existence of the trust is that the prices of their products have been reduced much more than the prices of other products. When you spoke of coal I supposed you spoke of soft coal. There has been no trust in soft coal, excepting one formed within a week or two past. There was none at that time. The figures you have quoted show that there has been a very much larger reduction in coal than oil. A. I should say that the comparison is rather unfair, for you take oil at the point of production and coal at the point of delivery, where it has acquired cost by every movement. Let us reverse the case, and take oil at the seaboard; take the price of oil at the seaboard at that time.

Q. Take them both at the point of production. I believe the same conclusion would hold good. What would it cost to ship a ton of that coal from the initial point? A. It depends on the initial point.

Q. In the vicinity of Pittsburg? A. It would have cost more than one-half of the $12, at least, to get it there. I am not competent to state the price of coal, and I am not defending this gentleman's figures. We are speaking of the conditions of the time in the mind of the man who did the writing.

PRICES OF CRUDE OIL AT THE SEABOARD IN 1867 AND AT PRESENT.

Q. (By Mr. Smyth.) I should be glad to know as to the comparative cost of oil delivered at the seaboard today and in 1867, and the cost of coal delivered at the seaboard today and in 1867. A. In 1865 and 1867 existing conditions were very much the same, with this difference, that crude oil was higher. The price of coal remained about the same between 1865 and 1867, but in 1865 the statistics show that the cost of crude oil at the seaboard was 37 cents a gallon.

Q. What is the price of crude oil delivered today? A. $1.37 or $1.40.

Q. Per gallon? A. Per barrel.

Q. Can you give us the gallon price today, so as to make a comparison? A. It is somewhere in the vicinity of 5 cents a gallon.

Q. Then the reduction has been from 37 cents to 5 cents. Can you tell us about coal? A. I do not know anything about that.

Q. (By Mr. Ratchford.) Was that 37 cents the normal price of the period of which you speak? A. I can not tell you as to that.

Q. I asked the question because you stated in one of your papers that oil fluctuated from 10 cents to $2.50 a barrel at the well. A. From 10 cents to $1.75.

Q. I understand you to say $2.50. It seems the price of oil has taken some rapid jumps up and down. A. We are now discussing a period in the oil business when it was controlled entirely by speculation. The business had hardly gotten down to a stable basis and the value necessarily changed rapidly in those days.

Q. (By Mr. Farquhar.) In the statement you were reading from, were the prices conditioned on speculation entirely, on production, or on transportation; that is, the fluctuation from 10 cents to $1.75? A. I think they were conditioned on all three, but mostly on transportation—the difficulties of getting the oil to market.

Q. (By Mr. Phillips.) Was not the fluctuation from 10 cents to $1.75 caused by striking a large number of flowing wells? A. Overproduction. We had never had a consumption equal to over 1,200

barrels a day up to that time. The consumption was 1,200 barrels a day, and a constant outflow of 7,000 or 8,000 barrels a day caused depression.

Q. (By Mr. Farquhar.) Overproduction at that period—it is not possible to account for it by a combination of producers? A. Oh, no; not at all.

THE PRODUCTION OF OIL IN 1869.

For 10 years up to 1869 the amount of oil produced was about 25,700,000 barrels. Butler, Armstrong, and Clarion counties, and Church run, near Titusville proved the most active centers of oil development during that year. Small extensions in the producing territories at Rouseville and Cherry Run were made and there was some excitement over a few large strikes on West Pithole creek. On January 30, 1869, the Pittsburg Commercial Gazette reported 68 refineries in operation in Pittsburg, and stated that the petroleum trade of the city amounted to $13,000,000 per year. On February 12 a meeting of oil producers was held at Titusville and the Petroleum Producers' Association of Pennsylvania organized (being the first association of producers), with George K. Anderson, president, and F. W. Andrews, vice president. This association was called into existence to take cognizance of the statistics of the region, for the better protection of the trade. The shippers and buyers of that day had begun to influence the speculative market by reports and by bulling and bearing it to their advantage. The purpose of this association was to gather statistics and to inquire into the general condition of the trade for the betterment of the producers, and from what I know of it I say now it was necessary. On March 11 it was reported that the Vera and Blake well, Petroleum Center, which was opened September 22, 1868, had sold, up to date, 22,699 barrels of oil, for which the owners had received $98,500. July 1, 1869, work was begun on the extension of the Jamestown and Franklin Railroad, from Franklin to Oil City, contracts being let for the entire distance, including the tunnel at Oil City.

Q. (By Mr. Jenks.) Was the producers' association distinct from the refiners? A. Yes; it was distinct from the refiners' association.

Q. (By Mr. Phillips.) It was not a chartered company? A. No; it was not a chartered company at that time, but it led into other associations and agencies by which stock was issued.

PRICES OF PETROLEUM IN 1869 AND 1870.

At the close of 1869 the New York Daily Bulletin said: "The price of petroleum ruled higher during 1869 than during any of the three previous years, and those engaged in the production of oil have received larger profits in comparison with the capital employed than during any previous year. The profits of the refiners and dealers have been fair, but very much less than those of the class first mentioned. Speculation has been pursued on a colossal scale, and prices underwent great and violent fluctuations. But notwithstanding this the year closed with a much smaller volume of failures than usual, and on the whole was singularly exempt from any serious financial disasters."

Values showed a downward tendency in 1870, and the market steadily declined from the prices established during 1869. The extreme range was from $4.90 per barrel in January to $2.75 in August. The year 1870 closed with petroleum at from $3.30 to $3.50 per barrel.

That decline may be accounted for in a great measure by the hostilities between Germany and France, for the closing of their ports against us operated seriously with the oil business of this country.

In January, 1870, the first well drilled on the bluffs on the Robinson farm, at Parkers Landing, started at 40 barrels a day. In February a petroleum association was formed by Cleveland refiners for the purpose of protecting the refining interests of that city.

Q. (By Mr. Jenks.) In February of what year was this refiners' association made? A. 1870; refiners' associations were very prolific in those days; they were found wherever the refiners were, exactly as the producers were associated.

The year 1870 was a very important year in many respects, because of the striking of the well at Brady's Bend; that developed fourth-sand territory. The finding of a flowing well in that country rather agitated the trade and stimulated things. Large and important developments were made at West Hickory. Coming all at the same time, these new developments created a very serious situation.

Q. (By Mr. Smyth.) What was the percentage of increase just at this time from the flowing wells? A. I can not state the percentage, but it was very large.

Q. You said a little while ago the consumption of the world was twelve hundred barrels a day? A. I was speaking then of the overproduction in 1861, which was caused by large flowing wells.

PRODUCTION AND PIPE LINES IN 1870.

Q. What period are you now speaking of? A. 1870, or a year later. Parkers Landing at that time assumed very formidable proportions. There were at least twelve to fifteen separate, individual pipe lines; and there was one, named the Mutual Pipe Line, just reaching the Karns Pipe Line, organized that year or the year before, which began buying oil on the same terms as the other lines. At this time the other pipe lines were bidding for the production, probably 800, but not exceeding 1,000 barrels a day, at Parkers Landing. The Karns was one of them. It would take oil on the same terms as another line; each line framed its own terms, and many of them had drawbacks, rebates, and private contracts with producers and shippers. Competition was such that they were forced into that in order to get business and prevent others from going in.

On April 9 the production of the Petroleum

Center district was estimated at 1,426 barrels a day. The Karns Pipe Line began taking oil upon the same terms as the Mutual—25 cents a barrel transportation charges and 2 per cent for loss. By October, 1870, the total production of the region had reached nearly 20,000 barrels a day. The James S. McCray farm, which had a daily production during October of 2,686 barrels, declined to 1,944 barrels in November, a falling off of 742 barrels a day.

The important development of the year was in April, at Armstrong Run, eight miles southwest of Parkers Landing, which had an initial production of 1,000 barrels a day. The production declined rapidly, but other wells equally productive, with better staying qualities, came in later on. This was the first flowing well found south of Scrub Grass, and attracted universal attention.

OPERATIONS IN 1871.

The Titusville Oil Exchange was organized in 1871, and was the first regularly organized exchange in the oil country, although the trade at Pittsburg was organized some years previously. Exchanges were likewise opened at Oil City and Franklin.

The Titusville Herald places the daily production of the Pennsylvania field, on April 11, at 13,531 barrels.

Q. (By Mr. Phillips.) That was in 1871? A. That is in 1871; yes, sir. A. D. White, reporter for the Petroleum Producers' Association, for the lower district, issued the following report for July in Parkers Landing district:

"There are 441 producing wells, of which 63 produce all the oil, and average ten and one-tenth barrels per day, while the daily average of all wells is five and one-half barrels. The average depth of the wells is 1,060 feet, and the average cost of completing a well $5,200."

Hints of speculation by pipe lines in the production of oil increased; there were more than hints; there were rumors, and in some instances the result of that being that oil was not held the same by any two of the existing lines. There were scarcely any two of them that offered the same price for oil. The price was dependent very largely upon the reputation of the line for integrity. Those lines having a reputation for integrity—that is to say, oil put in their custody would be found when wanted—got the highest price. Those lines which were sometimes considered short got a lower price.

Q. (By Mr. Phillips.) Did the producers ever lose any oil through these pipe lines to which you refer, to your knowledge? A. To my personal knowledge, no; except the difference in valuation of their product; there was a difference in valuation, but I know of no loss.

Q. No embezzlement of oil that was left in the line? A. No embezzlement of oil.I have no personal knowledge of that. Rumors were circulated in midsummer of 1871, that the various pipe line interests of Pennsylvania were about to merge their holdings into a single combination, the whole to be under one management. No merger ever took place, or at that time; no merger took place at that time.

Operations this year took a very wide range. Bradford appeared for the first time in the oil reports. A correspondent of the Petroleum Center Record, writing under the date of September 29 concerning a trip made to Bradford, says:

"Bradford is a village of 300 inhabitants, and is altogether a very desirable point for the coming oil excitement which we feel sure is bound to break out in the vicinity. The Bradford well is down 90 feet and being pushed as fast as possible. It is located near a well sunk in 1864, which had an excellent showing and produced some oil, but was abandoned. About three and one-half miles south of this point Col. J. K. Haffey has a well drilling, and the indications are good for finding oil. North of this latter point are the two Job Moses wells, one of which is producing about two barrels and the other drilling deeper. The oil from the Moses wells sells for $22 a barrel (for lubricating purposes)."

It is important here in this connection as pointing out that the discovery of the Bradford region, which was developed say ten years later, or less than ten years later, the greatest field ever discovered, was long before actual developments ever took place there. The existence of oil, the presence of it, was known in that field at least eight years, and wells actually sunk even before the Butler and Clarion county fields were fully developed.

Q. (By Mr. Phillips.) It did not become a factor in the oil business until 1876 and 1877, did it? A. 1876, I think it was, or 1877; yes, sir; 1877.

Q. It became a factor? A. It became a prominent factor, a leading factor at that time, but the possibilities of the field always pointed to it as a field for wildcats, for some place that producers occupy their time, and led to overproduction, great overproduction. Operations in Clarion county had reached a point near the mouth of Turkey Run, where D. L. Kistler and others found a ten-barrel well. S. M. Kier, the pioneer petroleum merchant, developed a 20-barrel well on the Faust farm, near St. Petersburg. Marcus Huling's well, on the Ashbaugh farm, near St. Petersburg, was reported flowing 250 barrels a day, and 300 wells were reported in various stages of operation between Alum Rock and the mouth of the Clarion river at the close of October. These were all pioneer wells at that time.

HISTORY OF THE SOUTH IMPROVEMENT COMPANY.

The year 1872 is conspicuous for the remarkable progress in Butler and Clarion counties. Starting from a point at the Clarion river, remunerative developments penetrated to a point beyond Antwerp, more than five miles, and southwestward to Millerstown and Greece City, in Butler county, a distance of fifteen miles, with the prospect of further extension at both ends. The increase in production was rapid, owing to the large capacity of the wells de-

veloped in all of the new fields. In addition to a very large production of crude oil, there was an unquestioned over-capicity of pipe lines, and an overproduction of refining plants, so that these two divisions of the business, refining and transporting oil by pipes, became unprofitable. This is the year of the South Improvement Company, a movement which found few supporters in the region and was very generally execrated by the trade, and died, so to speak, "a-bornin'." Of all the multifarious movements having for their object the betterment of trade conditions, this one is perhaps the least understood. The movement was a combination of the railroads and certain refining interests. It had its inception with certain Philadelphia and Pittsburg refiners, with an agreement for co-operation on the part of certain Cleveland refiners. But philosophical minds, viewing the subject from this distance, are agreed that it had its origin, as a matter of fact, with the railroad interests, rather than the oil interests. Refiners, ever satisfied with a fair profit, had been able and were willing to accept their chances with the trade, but with the railroads the case was slightly different.

The development southward from 1870 brought about conditions through which some of the important railroads of the country might be deprived of a share of the oil carring trade. The Pennsylvania road, however, was not affected by the transfer of activities from the Venango region to that of Butler and Clarion counties. The Allegheny Valley Railroad, on the one hand, serving as a feeder for rail shipments, and the Allegheny river serving the Pittsburg refiners, on the other, with barge shipments, the product ultimately coming to the Pennsylvania Railroad for export and interior shipments, gave them not only a fair but the lion's share of the carrying trade. The northern railways lines—namely, the Erie and New York Central—were naturally affected by the transfer of operations to distant fields which they could not reach with their existing connections. The first named road was materially aided by the gathering lines of the Pennsylvania Transportation Company, operated by Henry Harley, but the New York Central and its connecting lines were left without petroleum feeders of any description. This resulted some years later, and after the failure of the South Improvement Company to establish itself, in the creation of pipe lines by the New York Central interests. Therefore, at the close of 1873 all the principal railway lines touching the oil regions at any point were served by feeders or pipe lines specially provided. From this period developments were so rapid that no attempt will be made to trace the progress of the business chronologically, except by movements in the order in which they take place.

Now this leads up to the time of the South Improvement Company, when the overproduction of the pipe lines and the competition of the railroads were so very sharp, and it sought to correct all the difficulties that the region has ever been troubled with in the way of discrimination in freights.

Q. (By Mr. Jenks.) Have you anything further to state with reference to the South Improvement Company? A. I have here about 1,000 pages touching the whole question—the history of the proposed movement.

Q. You could, perhaps, make a brief statement concerning the South Improvement Company, and then give us additional information? A. I have nothing further on that branch of the subject, unless I refer to the Derrick's handbook, about what was done. The first move was to meet and combat the South Improvement Company. The producers combined, and the combination took in all the oil interests of their class; well owners, producers, and the railroads—that is, the Oil Creek Railroad and the small railroads of that region—felt satisfied.

Q. I understood you to say that the railroads themselves organized an association and made special discriminations in rates, and that the South Improvement Company was organized afterwards? A. Yes; but its inception was with the railroads through the carrying trade.

Q. Then it was your idea that the railroads suggested the formation of the association called the South Improvement Company, and that they then offered it special rebates, or more favorable rates than they were giving to other refiners? A. That is my idea; and it is, further, my idea that it originated in Pennsylvania. The Standard Oil Company has been very much maligned in connection with the South Improvement Company.

Q. (By Mr. Phillips.) You said that the Cleveland and Pittsburg refiners were in this movement, and then that the refiners after defending it were opposed to it? A. I said the local refiners.

Q. (By Mr. Jenks.) Then the association was made up practically of Pittsburg and Cleveland refiners for the purpose of getting differential rates from the railroads? A. It was the purpose to make differential rates, but it was never carried out.

Q. (By Representative Livingston.) Were any advantages given by the railroads to any oil producers or refiners? A. I am not aware of any.

Q. (By Mr. Farquhar.) Was this South Improvement Company incorporatd by the legislature of Pennsylvania? A. It was incorporated under some other name; I think they purchased one of the numerous charters under the old constitution, prior to 1873. I do not know just what name the charter was first issued under; but whatever it was, they had, among other things, power to change the name of the corporation. It was a charter issued by the State of Pennsylvania.

Q. (By Mr. Phillips.) A special charter?

Q. (By Mr. Farquhar.) That is the very question I wanted to ask. Was it a special enactment that gave authority to this South Improvement Company? A. Yes.

Q. It was incorporated for the purpose of refining, transportation, sales, and everything else? A. That is the way I understand it, and I think to operate railroads also.

Q. What interest did the Pennsylvania Railroad have in the South Improvement Company? A. The conviction was general in the oil region that

the Pennsylvania Railroad was really behind it. It never passed beyond suspicion; there was no proof of it.

Q. (By Mr. Jenks.) Then, if I understand you, when this agreement came to the knowledge of the public, there was so great an outcry on the part of the other refiners that the company was itself abandoned and its charter annuled by the legislature? A. That is substantially the whole story; it rose and fell within six months.

Q. And nothing further was attempted? A. Nothing further was then attempted.

Q. (By Mr. Phillips.) Are you aware that after the South Improvement Company charter was annulled and the subsequent contract with the producers and refiners of oil by the railroads was made, giving equal rates to all without rebates or other discriminations, that George R. Blanchard, second vice president of the Erie Railway, testified before the Hepburn committee, in 1879, that said contract only lasted two weeks? A. I have no knowledge on the subject at that particular time; I am not familiar with the investigations of the Hepburn committee, but I understand that such an inquiry was made in 1879; I can not testify as to exact date.

Q. If this were a fact, would it not leave the same rates prevaling that prevailed under the South Improvement—that is, the same discrimination? A. No; I can not say that. I merely recall now my own assent; and I wish to substitute for that, that I do not know.

REBATES IN VOGUE BEFORE THE TIME OF THE SOUTH IMPROVEMENT COMPANY.

Q. (By Mr. Farquhar.) Is it a fact or not that every one of the pipe lines, up to the time of the establishment of the South Improvement Company, gave rebates and drawbacks? A. I believe it is; they gave special rates to favored customers.

Q. Without an exception? A. I can not testify so broadly as that, but I have heard it variously stated that such was the case, and I know one particular instance.

Q. (By Mr. Phillips.) You know one particular instance? A. One instance came to my knowledge in such a way that it was impressed on my mind.

Q. But you have no personal knowledge that there were such rebates? A. Yes; I have personal knowledge of that—my knowledge of the contract.

Q. Of the different pipe lines? A. Not of the different pipe lines. I said it had been variously stated, and that I know of one particular case.

HISTORY OF THE CONSTRUCTION OF PIPE LINES.

Q. You know of only one particular case in which rebates were given? A. Yes. We now come to the question of pipe lines. The first line, as I said this morning, was the Vansickle line, five miles in length, extending from Pithole to the Miller farm.

Q. About what distance? A. About five miles. Simultaneously with the starting of that line, another line was begun from the same point, that is to say, Pithole, and extended to the Allegheny river, seven miles in length, called the Pennsylvania Tubing and Transportation Company. The next enterprise in order was the Pickett & Sherman pipe line, extending from Pithole possibly ten and one-half miles. About the same time Harley & Abbott constructed a pipe line from Benninghoff run to the Shaffer farm, a distance of two miles. The next enterprise was Warren's line, from Pithole to Henrys Bend. From this small lines of one and one-half to five miles in length, but more generally two miles than five, were extended from year to year. There were very few five miles in length, but at various times they were all different concerns. Tidioute had its system of pipe lines, and the Empire Transportation Company was operating Pickett & Sherman's line, and several distinct gathering lines in different parts of the field at the same time. The first pipe lines were laid in what is called Parker's district, in 1869. Possibly there was a small beginning in 1868. In 1869 pipe lines began to be recognized as carriers. The first line there was the Parker, Thompson & Company; the next was the Karns. About the same time, however, Martin & Harms, of Petroleum Center, built a line known as the Foxburg line, subsequently named the Mutual Pipe Line. Then followed the whole Mutual Pipe Line System extending out to St. Petersburg and running throughout Clarion county, throughout the entire field ten or twelve miles. The Mutual became quite an extensive concern. The next in order was the Grant Pipe Line, at Parkers Landing, a small gathering line, getting its oil from the Black and Milford farms, at Parkers Landing, and terminating at the river and railroads. Previous to this time and during the Pithole developments and those immediately following it around Fagundas, Vandergrift & Forman started a system which was later extended to the Cranberry district, Pine Grove township, and the Milton farm, and, with the opening of the large wells in Bear Creek valley, to the river at Bradys Bend and throughout the producing district in Butler county, and subsequently to Concord township, in Butler county, on the development of what became the Greece City field. This line formed a nucleus of what is now known as the United Pipe Lines System. The next in order was the Relief Pipe Line Company, starting at Millerstown and terminating on the Allegheny river. This pipe line development brings us down to the period 1874-75, and what I have named thus far had been constructed on one side of the river; that is, on the side of the Butler and Armstrong developments. On the other side there was equal activity. Marcus Hulings constructed the Antwerp Pipe Line, taking oil in opposition to the Mutual Pipe Line. Later on the American Transfer Company commenced to compete for business. Then came the Atlantic Pipe Line. All these lines would average about ten miles in length—from seven to ten miles in length; possibly the Atlantic might exceed that, for the reason that they had two termini, one on the river and one

on a branch railroad. Two of these lines subsequently constructed trunk lines from the Clarion field to Oil City, and delivered oil there, which was at that time a common point. Common points were points of common shipment where stated rates were given. The aim of the pipe line, so far as possible, was to reach a common point, to get the advantage of the freight rate. The original pipe lines were merely transporters of oil, but through the exigencies of operation they became buyers of oil; not in their corporate capacity but by some arrangements outside of the corporation. Each one of them had a purchasing department and the prices in all lines varied to some extent. Very rarely was the same price stated at the same time on two lines. This condition existed up to 1877.

AGREEMENTS WITH RAILROADS FOR THE ESTABLISHMENT OF THROUGH FREIGHT RATES.

The result of this enormous competition and over capacity of pipe lines was that no line was able to earn by its legitimate function sufficient to sustain itself. Therefore, the purpose of the association you speak of by the railroads was to establish a through freight rate. These pipe lines were in some manner connected with one or the other of the four leading railway lines and the rate of freight was established from the wells to the seaboard, or from the refinery, wherever it was, to the termini. In 1874 Mr. Rutter, general agent of the New York Central Railroad, issued a new freight tariff in which it was expressly stated that all shippers receiving oil from pipe lines would have rebated to them 22 cents a barrel.

This was the beginning of the rebating assessment or charge. Considerable tumult was occasioned by this circular; meetings were held, resolutions adopted, and an attempt made to influence the railroads to abandon the rate; at all events that is where the rebate charge of 20 or 22 cents a barrel, about which testimony has been taken by other commisions and which was given to pipe lines, started. Both the pipe lines and the railroads wanted the oil, and their principals, or whoever they were, whatever railroad was back of them, were satisfied to divide the freight tariff with the pipe lines in order to get oil freight for the railroads.

Q. (By Mr. Jenks.) Did all those who shipped oil over these lines generally receive this 22 cents rebate? A. Yes; all shippers who patronized the pipe lines within the pool, but not all pipe lines, either—I want to correct myself on that point, because through the active competition, about 1873 or 1874, a pooling arrangement was entered into by the pipe lines; it was an attempt on their own part to get the pipeage. Failing in that they failed to make a success of their organization with the pipe line association. Then they brought out the Rutter circular, in which I think all the railroads concurred. If the circular is of any interest you will find it already published in the investigation before the Manufacturers' Committee in 1888. It would be loading down your records to note it again.

THE CONSOLIDATION OF THE PIPE LINES THE RESULT OF EXCESSIVE COMPETITION.

This condition existed from 1874 until some time in 1877, when there was a consolidation of certain pipe line interests. This consolidation grew until about all the pipe lines in the region were members of one firm known as the United Pipe Lines Company. The organization was effected some time in 1877 or 1878. The United Lines started, as I understand it, with a capital of $3,000,000, and acquired by purchase the property of the Columbia Conduit Company and the Empire Line, these two being the strongest, and a lot of smaller lines.

Q. Do you think the cause of this combination among the pipe lines was the extraordinary competition that existed among them practically making the business unprofitable? A. There is no question about that. It was the overcapacity of pipe line enterprises, or the eagerness with which individuals rushed into it. Nearly every person within a mile of the railroad handled his own oil, so far as it was possible. By getting the small lines in that way they formed the nucleus of other lines. Having to take a little capital here and there, they got into the pipe line business. The pipe lines were not equal in strength and capacity or integrity. This period of overproduction of pipe lines resulted in a great deal of embarrassment to the trade. It is a matter of public information that some of the lines were not able to make deliveries on demand. Suits were entered in the courts for false statements after the pipe line law of 1874 went into effect. That was the cause of the consolidation of the pipe lines. It was a necessity. The business could not have existed had it not been done.

Q. (By Mr. Phillips.) Was not there more than one suit entered of the kind of which you speak? A. I recall but one at this time.

Q. Yet there was a multitude of pipe lines at the time when the suit was entered for false statements? A. I say that from information, because I have the information here. I only speak of what I know. This leads up to the consolidation of the pipe lines. When this consolidation took place, during the period of the greatest tribulations among the pipe lines, from 1874 to 1876, the daily production fell from 29,937 barrels in 1874 to 24,504 barrels in 1876. It rose in 1877 to 35,988 barrels, and in 1878 to 41,544 barrels. From that time on until the highest production in 1897, which was 96,357 barrels, there was an annual increase in production.

Q. Was not the production in 1878 larger than you have named there, being after the Bradford field was opened up? A. Eighty-one thousand barrels.

Q. Did not the Bradford field at one time produce 80,000 barrels per day? A. That was said to be the case; it was about 1880 or 1881. The year 1878 was

the period of the earlier developments. I have heard it stated as a matter of fact that the United Pipe Lines, which began business on a capital of $3,000,000, afterwards increased it to five million, but paid no dividends for three years after its organization, or until after the opening of the Bradford field.

THE OWNERS OF THE UNITED PIPE LINES.

Q. Who were the owners of the United Pipe Lines then; and who are they now? A. I can not say who they were then; the National Transit Company owns it now.

Q. Did the Standard Oil Company control the National Transit Company when it was organized? A. I can not say as to that; I do not know that they did.

Q. Do they probably now? A. The National Transit Company?

Q. Yes. A. It is a part of the Standard system.

Q. And was from its inception, A. I do not know who the owners were.

Q. It is the Standard's system, then? A. Yes.

Q. (By Mr. Faruhar.) Can you state at what time the Standard took an interest—an immediate pecuniary interest in this pipe line; what year? A. Well, that would be very difficult to answer. I should say about 1877.

Q. (By Mr. Jenks.) It was the refiners practically who organized the United Pipe Lines system? A. Yes; the Standard was an aggregation of firms. It was not a Cleveland concern alone. What we know of the Standard is that it was an aggregation of the strongest refining concerns in the country.

Q. And they organized themselves into a pipe line system? A. Well, they were in it.

Q. (By Mr. Phillips.) They controlled it then and control it now, do they not? A. It is a part of what is known as the Standard system. That is as near as I can answer you. I guess there is no secret about that.

Q. (By Mr. Farquhar.) What proportion of interest did the Standard Oil Company have in the United Lines in 1877? A. Well, I have heard it estimated that in 1877 they took a little more than one-half, because in the formation of the United Pipe Lines, a number of pipe line owners retained their interest and became officers in the United Pipe Lines.

Q. So that the establishing of the pipe line was a mutual arrangement between the refiners? A. It was a mutual arrangement.

Q. But principally of interest to the Cleveland men? A. Principally of interest to the Cleveland men.

Q. (By Mr. Phillips.) They were the largest holders? A. Well, I am not prepared to say that, because I do not know.

Q. (By Mr. Farquhar.) But the parties in Cleveland interested at that time in the so-called Standard were the same parties as are now interested in the Standard companies? A. I believe so, with very few exceptions.

Q. This Vandergrift & Forman Company? A. Yes; Mr. Vandergrift was president of this line. He was the first president of the line and remained the president.

Q. The Rockefellers were in there as managers? A. I never understood that they were.

Q. (By Mr. Phillips.) Was not Vandergrift president of this line for some years? A. I believe he was; I know that he was.

Q. You do not know when he resigned? A. Yes; I do. He left the service about 1885, or within a year or two of that time.

Q. And about the same time resigned his position as director of the Standard Oil Company? A. I never understood that he was a director of the Standard Oil Company; I am receiving now my first information on that point.

Q. I have been informed that he was acting in that capacity. A. It is needless for me to say the information is not common in the oil country or I certainly would have heard it. He was connected with the Imperial Refining Company. Vandergrift & Forman and John Pitcairn were very large holders in that; it passed to the Standard Oil Company.

Q. (By Mr. Farquhar.) But that was chiefly Pittsburg money and not Cleveland? A. It was all Pittsburg money or railroad money in the Imperial Refining Company.

THE FALL OF PRICES AND ATTEMPTS TO LIMIT PRODUCTION.

In 1882 I find the largest daily output. That was the period of the development of the Bradford field. It was 82,358 barrels. The sudden increase could have but one effect upon the prices, and there was a downward tendency. Prices dropped of necessity because there was more oil than the world could take. I will run over hastily the period when this depression made itself most manifest. In 1866 there was an agitation for a shut-down movement with the object of bettering the condition of the producers. In 1862 right after the period of the flowing wells we have noticed that there was a movement to turn the stopcocks on the wells and retard production. In 1872 there was an agitation for a suspension of operations both before and after the agitation concerning the South Improvement Company. The first practical shut down went into effect that year—a shut down that was very successful and included both production and drilling. It was almost absolute, as nearly absolute as anything human can be.

Q. What effect did that have on the price of crude oil? A. It raised the price of oil.

Q. (By Mr. Ratchford.. Was that the main object of that agitation? A. The object of the combination was to increase the price of crude oil which had been depressed by competition.

Q. (By Mr. Farquhar.) How long did that shut down last? A. Thirty days.

Q. Do you know how many barrels were com-

prised in that shut down? A. Well, I said it was almost total.

Q. Total? A. Yes; the daily production then was 17,000 barrels; it was practically total.

Q. This was an agreement between all the producers in that field? A. An agreement between all the producers in all the fields.

Q. In all the fields? A. In all the fields.

Q. (By Mr. Phillips.) Do you know about the effect of that afterwards? Did it induce a large amount of drilling and increase the production? Do the facts show that there were a great many more wells drilled immediately after the shut down than before, through anticipation that prices would remain high? A. That effect was apparent, but it does not account for the great decline in production during the next year. There was an impetus given to drilling for the next three months after the shut down that made itself seriously felt in prices; but the decline that took place in 1873 was due to the large wells in the neighborhood of Millerstown. At that time we had, to vex the trade, several points where they were getting wells averaging from 700 to 1,400 barrels a day. I am speaking now of initial production. Take what was known as the Troutman, Modoc, Millerstown, and Buena Vista—that section has been productive of very large wells.

PRODUCTION INCREASED BY DEEPENING OLD WELLS.

Q. Was not that enlarged production caused by the fourth sand running through under the third sand belt, so that it was only necessary to deepen the wells about 60 feet? Were not a large number of third sand wells deepened to fourth sand at comparatively little cost at the period to which you particularly refer? A. That period comes later. Fourth sand discoveries were made in 1873, but the development had no considerable effect until 1874. Its presence was felt in 1873 in the Karns City district, in the Tack and Morehead wells.

Q. That was the reason that the others were deepened? A. That was what caused the wells to be deepened. From that time forward during the next year the most remarkable development ever seen in the oil region was sprung upon the trade. No one was in condition to receive it. All that was needed was to drill less than a hundred feet, from 65 to 85 feet—that is, one day's drilling—to deepen a well from one rock to another and oftentimes quadruple its capacity.

Q. The increase by deepening those wells was about 13,000 barrels per day, was it not? A. I have no doubt but the rapid development of the field lasted for about six months. Most of the wells were not deepened before midsummer, 1874, because we found the production of 1874 only 2,000 barrels greater than the production of 1873; that is, the daily production.

THE SHUT-DOWN MOVEMENTS OF 1873 AND 1874.

Now, about 1873 there was a disposition on the part of the producers in every section outside of that in which these large wells were found to suspend operations. The remuneration was so small as to leave no inducement to continue, except for a big well. In 1874 an independent shut down plan originated in Clarion county. I will not call it independent because it was local. The region at large did not participate to any great extent. In the northern extremity of the Clarion fields at this period some very large flowing wells were found, and prices were naturally off that year, the competion among the pipe lines not leaving them anything. So there was an agitation for a shut down, which was only effective locally. In 1876 a plan was started for pooling the surplus oil as a means of advancing the market; but conditions improved so rapidly about midsummer that it became unnecessary, and there was one of the greatest bulges in the market ever known since the trade had become established on what might be called a firm footing. The advance to $4 a barrel in the fall of 1876 was responsible for nearly all the ills that followed for the next ten years; it called the attention of persons not permanently engaged in the oil business of the great amount of money to be obtained through drilling wells. Prices did not continue long at $4. In the fall of that year a peculiar development was started in the region of Bullion. I say peculiar, because it was to one side and out of the usual line of oil belts. This field, not great in extent, was yet large enough to add within two years 3,000,000 barrels to the production. Bradford coming on at the same time, gave the producers about the worst quarter of a year they ever had, and it might be extended to a quarter of a century, because prices have scarcely recovered yet.

ORGANIZATION OF THE PRODUCERS' PROTECTIVE UNION.

In 1877 and 1879 what was called the Producers' Protective Union was started in a small way as a result of the effect of the Bullion development on prices. It was the work of a few producers at Elk City, in Clarion county, who thought that by uniting their interests and suspending operations they might induce their friends and neighbors to join them until they formed an unbroken chain. David Armstrong formed the first union and within a short time became the head of an organization taking the name of the Petroleum Producers Union. This movement continued for two years. When once fairly started Mr. B. B. Campbell, who was called to the presidency, carried the organization along for a grater period than any others of a similar nature that had ever been formed up to that time. Organizations since that time have lasted for longer periods, but up to 1879 no similar movement had lasted two years.

SUITS AGAINST MEMBERS OF THE STANDARD OIL COMPANY AND PIPE LINES.

This movement, which started as a protective concern, developed rapidly into an aggressive organization. They undertook to fight the transpor-

tation companies and the railroads. Suits were started in the Supreme Court of Pennsylvania to annul the charters of pipe lines, and criminal actions instituted against some of the owners of pipe lines, members of the Standard Oil Company. The object of these suits was never developed. The aim, if it was to improve their condition, failed of its purpose.

Q. Where were the suits brought against members of the Standard Oil Company and the pipe lines? A. A suit against members of the Standard Oil Company was instituted in Clarion county; the proceedings against the pipe lines were in Venango county.

Q. Was that suit tried in Clarion county or was it removed from Clarion county? A. It was not tried anywhere and was not removed from Clarion county.

Q. Did they not take an appeal to the supreme court at Philadelphia? A. No doubt they did, but, as I understand it, the suit was settled outside of court.

Q. Yes, but after an appeal was taken? A. I am not clear on that point.

Q. It was a suit for conspiracy, was it not? A. It was called a suit for conspiracy, but it hardly was a conspiracy from the fact that it was never tried.

CONDITION OF PRODUCERS NOT IMPROVED BY THE COMBINATION.

Q. Oh, certainly not. You have covered the ground very fully; you have said it was a criminal suit? A. The condition of the producers was no better after the termination of that combination than it was before. The production continued to increase, and prices were falling with the additions to the stock. In 1879 the daily production was 54,206 barrels and the price 85⅝ cents. When the movement was started in 1877 the daily production was 35,988 barrels and the price $2.39⅜. That was the average for the year. That is what makes me say the condition of the producers was no better at the end of the combination than it was at the beginning. The great increase in drilling had not ceased to any extent; stocks had accumulated and production increased. In 1881, during the development of the white-sand pools in Warren county, an individual shut down occurred among the heavier operators. It was partially successful.

THE PRODUCERS' ASSOCIATED OIL COMPANY.

In 1884 there was an attempted combination of producers to restrict drilling. The movement, while very general, was only partially successful. That was the year of the Thorn Creek development, the period when very large wells were found in a small area. The persons engaged in engineering the shut down of 1884—that is, the combination of 1884 for the improvement of prices and the betterment of the condition of the producers—claimed and alleged that the failure was due to the want of co-operation on the part of the Thorn Creek operators, for it was carried out very generally through other sections of the field. One of the results of this was the formation of what is known as the Producers' Associated Oil Company, which is in existence today. This was a company formed by all the companies, all the existing producing companies, taking some of the shares. The capital stock, I believe, was $1,000,000, and the shares were parceled out to existing producing companies. It became necessary to purchase property in order to curtail production or stop the drilling. Purchasing was resorted to by the Associated Producers' Company, and all the shareholders participated in the profits accruing. It was considered a very wise arrangement at the time, and the fact that it is still in existence and doing business would attest that it was in every way a success. In connection with that I want to state another movement, born of it. It was a drilling contract, known as the boundary line contract, entered into by the operators connected with a subsequent shut down. It was the contract of the shut down combine of 1887 and was an agreement between the producers and the Standard Oil Company for mutual benefit. It provided for reducing production one-third and for relinquishing certain holdings in oil,6,000,000 barrels, I think.

Q. What year was that? A. 1877-88. In consideration of the receipt of 5,000,000 barrels of oil the producers on their part agreed to suspend active drilling operations and to restrict their production at least one-third for the period of a year.

RELATIONS OF THE PRODUCERS' ASSOCIATION TO THE STANDARD OIL COMPANY.

Q. (By Representative Livingston.) Will you explain to the commission what you mean by the producers? Does that take in all the producers—the Standard and the independent companies? A. No; I refer now to the Producers' Association itself, the association in existence today.

Q. What is the name of the organization? A. It was the Producers' Protective Association, and it is in existence and organized today. It was organized previous to 1887.

Q. That does not cover the independent companies? A. No; not necessarily. It is an organization for the betterment of their condition as producers, out of which came these independent companies which you refer to. They resulted from this agreement. I shall lead up to that presently.

Q. (By Mr Smyth.) Entirely separate from the Standard Oil Company? A. Yes; the organization is entirely separate from the Standard Oil Company.

Q. (By Representative Livingston.) Opposition? A. It is not opposition. They are in harmony in many respects; the proceedings state that.

Q. How are they hitched together? If they are in harmony what hitches them up?

Q. (By Mr Smyth.) What is their relation? A. The remunerative feature that existed in the origi-

nal contract between the Standard Oil Company and the Producers' Protective Association——

Q. (By Representative Livingston.) Have you a copy of that contract? A. The contract is published in the voluminous report of the investigations of the Manufacturers' Committee in 1888.

Q. When you speak of producers do you mean the Standard Oil Company and the Protective Association? A. Yes, if you please; speaking of both sides during that one year.

Q. (By Mr. Phillips.) You spoke of the receipt of 5,000,000 barrels of oil. On what terms was that oil turned over, and what was the price of oil at the time this shut-in movement, as it is called in the oil country, began? On what terms, if any, was that oil turned over to the producers? A. The oil was turned over to the producers on condition that they suspend drilling operations as far as practicable and restrict their production at least one-third. The price at which it was turned over was 62 cents a barrel. The existing price at the time it was turned over was 10 cents a barrel more. The Standard sacrificed 10 cents a barrel on the oil when they turned it over to the association.

Q. That might possibly be; when the papers were drawn up it was in anticipation, but the day the contract was made it was 62 cents? A. I can only testify to the facts as they appear now——

Q. (By Mr. Farquhar.) You testified as to the agreement, that is all? A. Yes, and the price when the transfer was made; oil was 71 cents.

THE EXTENT OF THE COMBINATION.

Q. I wish you would state very explicity how wide this combination was, what class of producers it took in, and what control it had over the market and the consumer. A. Well, I should say that the agreement was far-reaching; it took in every class of producers they could get in. They made strenuous efforts to bring people into it, and I believe great sacrifices were asked on the part of the Standard Oil Company, or rather demanded, to enable some of the large producers to join it.

Q. (By Representative Livingston.) Now, then, if I understand that answer, you mean to say that they endeavored to get everybody into it if they could? A. Yes.

Q. Did they get them all in? A. No.

Q. Why not? A. Well, I think it might be said to be due to energy, enterprise, or hoggishness—anything you care to call it—that some people would stay out.

Q. (By Mr. Phillips.) The Standard people were as anxious to have other people in as the Producers'? A. It was mutual.

Q. (By Mr. Farquhar.) Who made the first proposition? A. That I am not prepared to answer; I do not think I ever heard it stated or saw it in print.

Q. Did not the proposition originate with this very company of which we have been speaking—the Producers' Protective Association? Did it or did it not? A. Well, as a matter of opinion, I should say it did.

Q. As a matter of common belief? A. Belief at the time; yes. Now, as to the other branch of your question——

THE EFFECT OF THE COMBINATION UPON THE CONSUMER.

Q. (By Representative Livingston.) The other part of the question was: How was the consumer benefited by it? A. The condition of the producer was bettered by it. Crude oil advanced 29 or 29½ cents a barrel. We will now see what refined oil did. I should say that the parallel of increase was regular; that, taking the annual average, the advance to the producer was no greater than the advance to the refiner and the advance to the public. Refined oil sold in 1887 at 6¾ cents retail, and the average for 1888 was 7½.

Q. What was the advance, then, on refined oil? A. About three-fourths of a cent.

Q. A gallon? A. A gallon. The price was not advanced to the consumer in proportion to what it was to the producer.

Q. The producer of crude oil? A. Yes, of crude oil.

Q. (By Mr. Farquhar.) Do you propose to say that the Standard Oil Company stood the difference? A. Somebody stood it.

Q. Well, what is your judgment? A. If we hold that the Standard Oil Company produces three-fourths of the refined oil they certainly stood three-fourths of it.

Q. (By Representative Livingston.) The Standard Oil Company was involved in that original proposition. It would seem that they were working for their health along about that time? A. It did seem so to me; I thought so.

Q. Now, then, what was the ulterior purpose? If they were standing that loss, in the end they hoped to gain. Do you know how, in the end, they hoped to be benefited by the arrangement, after standing the loss? A. That question involves an opinion on my part that I do not think I would be justified in submitting. I do not know that I can answer it in any intelligent way. To answer it would be to give an opinion only.

Q. In the end they would put down competition and regain all they had lost? A. No, sir; that is not it. I can not agree with that, but I can agree with one branch of it. The betterment and the benefit of the producer is always the concern of the the Standard. If you kill the goose, where are you going to get the golden egg?

Q. There are more geese. A. Oh, no. The supply is limited.

Q. (By Mr. Smyth.) Was the cost of refined oil lessened at that time? A. I do not think there was any material change in that feature of it.

Q. They could not have recouped their loss by reducing the price in that way? A. No, I think the

recoveries have been fully made in oil and its by-products.

Q. I understood you to say that the price was advanced to the producer, but was not advanced in proportion to the consumer. Now, was the process cheapened in the meantime? A. I think not.

Q. (By Representative Livingston.) The witness seems to be an intelligent one all along this line, and I do not see why we should not insist on having his opinion as to the nature of this recoupment? A. I can state it as a matter of opinion.

Q. Well, that is all. A. I am very willing to state my opinion.

Q. Where would they recoup and how? A. Well, the betterment of the trade would leave a condition of harmony that could not exist where everybody was working at unremunerative prices.

THE COMBINATION THE RESULT OF TOO MUCH COMPETITION.

Q. Now, that word "harmony;" do you mean by that the killing of competition? A. What word?

Q. The word "harmony." Do you mean by that the removal of competition? A. My dear sir, this whole trouble was brought about by competition, too much competition in drilling, too much drilling.

Q. That is what led to the combine. You needed a combine to control it? A. It led to the combine, and that leads me to the question of one of the movements connected with the shut down of 1887 and 1888. In the drilling contract it was provided that the members of the association were not to drill a well along any line within a stated distance—that is, closer than would give an area of 20 acres for each well.

Q. That lessened production? A. The aim was to lessen production, and therefore it benefited the trade.

Q. Now, I want you to use another word for that word harmony. You said trade was improved because it produced a kind of harmony among all the parties interested here. You mean that it took all the competition out of the way? A. Well, I can not say that competition was destroyed.

Q. I do not mean to say it was, but crippled or lessened?

Q. (By Mr. Farquhar.) Hypnotized?

Q. Hypnotized? A. I will adopt that term, "hypnotized."

Q. Was it not lessened? A. Oh, unquestionably.

THE LABORER SUFFERED BY THE RESTRICTION OF COMPETITION.

Q. If it was lessened, who suffered by it, the producer or the consumer? A. Neither—labor.

Q. Labor? A. Labor lost it all.

Q. That burden was put on labor? A. The burden was put on labor; but let me say that in addition to this 5,000,000 barrels of oil——

Q. Did you not say that crude oil increased 29 cents a barrel, and refined three-fourths of a cent a gallon? Now, how did the laborer bear that charge? Was not the increase paid to the producer, and the 29 cents a barrel by the consumer? A. As far as the difference in price would be represented by the difference in cost.

Q. Then the laborer did not bear that loss, but the consumer? A. True from your standpoint and true from mine.

Q. You have got two ways of looking at that? A. Yes.

Q. You know what the Scripture says: "He that seeth double"? A. Yes; I neglected to state that in addition to the 5,000,000 barrels 1,000,000 was set apart in the agreement for labor. To that extent labor did not suffer.

Q. (By Mr. Phillips.) Was not that 2,000,000? A. Yes; the Standard set aside 1,000,000 and the association 1,000,000 to the labor, and the profits of the 2,000,000 barrels compensated them to that extent.

EFFECT OF THE COMBINATION UPON THOSE WHO DID NOT GO IN.

Q. (By Mr. Kennedy.) You said that about all of the producers went into this association, and I infer that enough of them entered into it to accomplish the object that they had in view. Is that true, and is it true that those who stayed out did not affect that object?

Q. (By Representative Livingston.) Ask him if the man who did not go in was not hurt. Would it not have been better for him had he gone in? A. The ones who stayed out made a lot of money by it, because they went on drilling and secured large wells, and most of them got rich. Many of them got rich by simply taking advantage of the producers' necessities. It was necessary to do something at this time. Producing oil was not a remunerative business, but at the prices at which oil was left at the close of the year it was remunerative. Nearly the entire number of operators in the Washington oil field, then the greatest field we had, stayed out because they were getting very large wells. One person drilling along the line would start another, and in this way an endless chain was formed around the group of wells. It was just like setting up a row of bricks and starting the end one—all the rest go.

THE COMBINATION AND LABOR.

Q. (By Mr. Phillips.) Well, did labor work in perfect harmony with that movement throughout the oil country—with that particular feature of it—and agree to go into the thing? There was harmony between the Standard and the laboring people, was there not? A. So far as I heard, there was.

Q. (By Mr. Farquhar.) Do you think they could help themselves, whether they went in or not? A. Oh, yes, they could.

Q. Was labor organized at that time? A. One of

the first steps of the laborers, the well drillers, and the tool dressers, was to combine themselves in an organization. It was my observation, and I examined it very closely and took a great interest in it, watching it from year to year, that the drillers could have made a failure for the producers had they been so determined. Enough of them could have got together to start drilling on their own account.

Q. (By Representative Livingston.) Then, it is your observation that labor in that instance was not damaged by the combination? A. Not by that particular combination, but what you referred to a while ago was the drilling contract.

Q. (By Mr. Phillips.) Was not the price of labor put up after this shut in to the scale agreed upon in the movement? A. Yes, there was a scale adopted.

Q. (By Representative Livingston.) Who paid that? A. The oil producers.

Q. Did they pay it in the price of the oil? A. That is in the construction account; it goes into drilling the well, that is, building the superstructure over the well. It just adds that much to the cost of drilling wells.

Q. That does not have anything to do with the cost of the oil? A. No, not at all. It diverts the producers' profit to the extent of the advanced cost.

Q. (By Mr. Kennedy.) What did you say was the period of that shut down? A. One year.

Q. What was the amount of oil set aside by the producers and the Standard Oil Company for the benefit of labor? A. One million each, but the 6,000,000 originally came from the Standard.

Q. That oil was sold for the benefit of the laborers? A. After this shut-in; it was sold for their benefit and distributed by their organization.

Q. How did the money thus distributed to them compare with the amount they would have earned had the work continued in that field?

Q (By Representative Livingston.) Did they lose anything by the combination?

Q. (By Mr. Farquhar.) Subsequently? A. I have not right at my tongue's end the amount that each individual driller received, but for the most part the driller constantly employed (what we call constantly employed) will perhaps work 200 days a year and make $1,000.

Q. (By Mr. Phillips.) Did not the laborers get more out of their oil being sold first at a higher price than the producers did? A. I believe that is true.

Q. (By Mr. Kennedy.) What I want to know is, did they receive anything like the amount of money they would have received had operations continued? A. About the only way I can get at a reply to that is to state that there were nearly 800 fewer wells drilled during the year of the shut down than the year previous, and labor would lose the amount to be secured from drilling 800 wells, provided the same number would have been drilled in 1888 as in 1887.

Q. By Mr. Phillips.) Then did labor receive compensation in addition to what they got in the shut-in points? A. It seems to me that labor received some addition in the way of increased compensation. It would be very difficult to state the precise loss of labor in drilling at that time. Drilling was very active in the Lima fields in Ohio, and gas drilling was very active also during all that period and furnished a new outlet for labor. But the married men living in distant portions could not get away, and they were the ones who would have made the trouble, if there was any, in that association.

CONDITION OF THE OIL INDUSTRY AT THE TIME OF THE COMBINATION.

Q. Were there not about 31,000,000 barrels of oil in tank on top of ground when that shut-in movement was inaugurated, and was it not deteriorating in value and the price very low, as you said before? Was it not the object of the Standard and the producers to prevent the deterioration of that oil and in the end to get a remunerative price, and also to advance the price of labor? A. The conditions precedent to that movement were worse than any that had ever existed before. Great stocks had accumulated in the Bradford field, the accumulation having started just ten years before that period and still continuing with a prospect of increase. The Washington field had been opened two years before and the largest wells found anywhere were there. A very prolific district had been found in Butler county, Reibold and Glade Run, where wells were obtained producing 3,000 barrels a day, and at the same period another development was going on at Saxonburg. That was the condition when this agreement took effect. It was entered into heartily on both sides for the betterment of their condition, and I believe they were both benefited by the movement. The stocks were reduced 10,000,000 barrels and upward. I have a leaflet showing precisely the amount and I will hand that in later.

Q. (By Mr. Ratchford.) I understand you to say that this shut down was brought about for the benefit of the industry and particularly the producers? A. Well, that the industry might survive would be my way of putting it.

Q. But from your standpoint are not prices cut for the same reason? A. No; I do not believe so. Prices are cut because the trade will not take the supply at the existing prices.

Q. I understood from your previous statement that prices are cut for the purpose of improving trade conditions, and I also take it from your remark that prices are advanced for the same purpose. Now, I want to know what the peculiar methods directly the reverse of one another? A. I am very willing to answer that question, but my explanation will be simply an opinion. In answer to the first part of your question, I will say prices are cut in periods of overproduction for the purpose of finding a market for the surplus goods. One of two things can be done—the oil may be

stored in tanks and carried at great expense until it can be put on the market at remunerative prices, or prices may be made to the foreign consumer that will induce him to take the surplus. I have no doubt that all companies manufacturing oil find it necessary at times every year to hold out inducements to the trade to take surplus goods off their hands. There is a period, from May until September, when there is a decline of one-third in the consumption of oil. If there is an overproduction of crude during this period of underconsumption, it becomes necessary to convert it into money, for it would seem like folly to add millions of barrels to the existing stock during four or five months when there would be no sale for it. These various branches of the oil business are dependent on one another, the producer on the refiner, the refiner on the producer, and the consumer on both. The success of any one branch depends on the success of the whole. The division of labor has not been carried out anywhere so fully, I think, as in the petroleum business.

Q. That is your answer to the whole question? A. Yes; that is the only way I can answer it. There is only one of two things to do—to find a market at a lower price or hold the oil for higher prices.

Q. If production continues? A. Assuming that production remains at a point above the consumption.

THE COST OF PRODUCTION AND THE PRICE OF OIL.

Q. Is the trust, combination, or whatever it might be called, in the habit of introducing its products into foreign markets by selling them at prices below cost? A. Well, I do not know that it is sold below cost. It is the aim of business people to get cost where they can.

Q. You are not in a position to say whether oil is sold below cost or not? A. They may sell at a very low margin of profit, and I believe they often are induced or, rather, compelled to do so.

Q. Have you ever known them to sell, in any particular case, in order to improve the market, as low as five cents per gallon? A. I never have.

Q. If it has been done, do you believe it was below cost? Have they been able to produce it at any time for five cents to your knowledge? A. Well, that involves an opinion on my part. I am not a manufacturer, and can not tell what the cost of producing is. I have heard—what are you leading up to by that question?

Q. I am seeking to corroborate or cast doubt upon testimony that has been given. A. I should say that five cents a gallon would be a very low cost for distributing oil under the existing conditions in this country.

THE PURPOSE OF THE STANDARD IN SELLING AT OR BELOW COST.

Q. It has also been said that the Standard Oil Company has sold oil below cost in cities in the United States where the competition of other companies has had to be met. A. I can only say that I have in my business sold advertising space below cost in order to have it occupied. I have heard that other business men do that in order to get off surplus stock. You have to sell below cost in order to get cash; and every spring and fall we carry one or two pages of advertising matter for merchants' clearing sales. They are all below cost. At a period of depression in trade, I should not be surprised if a business concern were compelled to sell at less than cost.

Q. I do not think your illustration is a fair one, because it is not your object to crowd out the fellow who was paying the regular rates. I understand, however, that it has been the object of the Standard Oil Company to drive out the man who was disposing of his product at a fair price. A. I have heard a good deal of that, but I have never seen any of it.

Q. After the control of a market has been secured by the Standard Oil Company through very low prices, is it not true that prices have advanced to a very high figure? A. Assuming the facts to be as you present them, I should think it would be a very natural result.

Q. (By Mr. Phillips.) Has not the Standard Oil Company followed up new, independent producers, from one place to another, where they have found a market, and reduced the prices there so as to drive them out? Are there not a great many instances of that kind on record? A. There are none in the oil country. My observation is limited to the oil country, and there are none there.

Q. (By Mr. Farquhar.) Are you prepared to make any statement as to the dismantling of plants by the Standard Oil Company? A. None at all. I have no information of that kind. The things we hear about have certainly not occurred within the range of my vision in the oil country.

OIL PRODUCERS HAVE NOT BEEN INJURED BY THE STANDARD.

Q. (By Mr. Phillips.) You may proceed in your own way. A. I have here a paper I should like to put in evidence showing that the producers of oil are not beggared in their business relations with the Standard Oil Company. It covers the years 1860 to 1898 and has not been presented before. It shows the amount of oil produced, the average price, and the valuation by years; the total production and valuation by decades and for the period, and also the number and cost of wells drilled.

EXHIBIT I.—*Yearly production and valuation.*

Year	Amount of oil produced	Average price	Total valuation
	Barrels		
1860	650,000	$9 60	$6,240,000 00
1861	2,118,000	52	1,101,360 00
1862	3,056,000	1 05	3,208,800 00
1863	2,631,000	3 15	8,287,650 00
1864	2,116,200	8 15	17,247,030 00
1865	2,497,700	6 59	16,459,843 00
1866	3,597,500	3 75	13,490,625 00
1867	3,347,300	2 40	8,033,520 00
1868	3,715,800	3 62½	13,469,775 00
1869	4,215,000	5 60	23,604,000 00
Total	27,944,500	.....	111,142,603 00
1870	5,659,000	3 90	22,070,100 00
1871	5,795,000	4 40	25,498,000 00
1872	6,539,100	3 75	24,521,625 00
1873	9,893,786	1 80	17,808,814 80
1874	10,926,945	1 15	12,565,986 75
1875	11,987,514	1 24¾	14,954,423 61
1876	9,120,669	2 57⅝	23,497,123 51
1877	13,337,363	2 39⅜	31,926,312 68
1878	15,381,641	1 17⅛	18,015,747 02
1879	19,894,288	85⅝	17,034,484 10
Total	108,535,306	.....	207,892,617 47
1880	26,245,571	94⅛	24,703,643 70
1881	27,561,376	85¼	23,496,073 04
1882	30,221,261	78½	23,723,689 88
1883	23,302,021	1 05⅞	24,671,014 73
1884	23,952,290	83⅝	20,030,102 52
1885	21,528,621	88⅜	19,025,918 81
1886	26,603,945	71⅜	19,988,565 74
1887	22,873,450	66⅝	15,239,436 06
1888	16,905,890	87	14,708,124 30
1889	22,349,825	94⅛	21,036,772 78
Total	241,544,250	.....	206,623,341 56
1890	30,067,307	86⅝	26,045,804 69
1891	35,839,777	66⅞	23,967,850 87
1892	33,425,877	55½	18,551,361 73
1893	31,362,890	64	20,072,249 60
1894	30,781,924	83¾	25,779,861 35
1895	30,959,139	1 35¼	41,871,235 50
1896	33,970,222	1 19	40,424,564 18
1897	35,165,990	78⅜	27,561,244 66
1898	31,647,860	91⅛	28,839,112 42
Total	293,220,986	.....	253,113,285 00
Grand total	671,245,042	.....	778,771,847 03

	Wells drilled	Cost pr. well	Total cost	Value of crude oil
1860-1870	5,000	$4,000	$20,000,000	$111,142,603 00
1870-1880	20,259	3,000	60,877,000	207,892,617 47
1880-1890	32,132	2,000	64,264,000	206,623,341 56
1890-1899	43,490	2,000	86,980,000	253,113,285 00
Total	100,881	.....	$232,121,000	$778,771,847 03

If one-fourth of all the oil produced went to the land interests they would receive $194,692,962, leaving $584,078,885 for the oil producers. Deducting the cost of drilling, there still remains $351,957,885; the cost of lifting the oil, at an average of 25 cents a barrel, would be $87,989,471.25, leaving $263,968,413.75 as the profits of the producing business for the last thirty-nine years, or an average of $6,768,420.86 per year.

DRY WELLS AND THEIR COST.

Q. Do your figures include dry wells? A. They include 15,000 dry wells.

Q. Is the cost of territory included—the bonus? A. 15,000 dry wells are included which never produced any oil and which cost the producers about $30,000,000.

Q. Is that your idea of the proportion of dry wells? Would not the percentage be much larger than that? How many wells were drilled altogether? A. 100,881.

Q. How many dry wells? A. Fifteen thousand.

Q. That does not correspond with the experience of a great many as to the percentage of dry wells, does it? A. It is consistent with the statistics available. We are liable to be mistaken, but our work is subject to revision. These are not our own figures in every case, but we vouch for those that are. We can take the figures from 1875 and vouch for them; beyond that we are dependent on the early statistician.

Q. Has the inspection of the oil country been sufficient to give you a record of all the dry wells? I can readily see that the striking of a good well would be reported; but has there been an organized attempt in the oil country to ascertain the facts as to the many thousands drilled and abandoned? A. During the first 10 years of the business there were probably a thousand men in the oil region who had been through it from the beginning to the end. Of these personal observers 900 probably had been over all parts of it. Mr. Wrigley was commissioned in 1874 to make a survey of the field and report as to the extent of the operations. His report carries us down to about 1875. From that time the newspapers have taken it up and published reports; and, whether right or wrong, they are subject to public inspection and criticism. The figures for the first 10 years are as nearly official as they can be made.

THE RENTAL OR BONUS FOR LAND NOT AN ELEMENT OF COST.

Q. I understand that you do not include the bonus or rental paid for holding the ground in these figures; but are there not many instances where persons pay a very large bonus for a prospective territory that does not prove valuable? Do not such payments amount to many millions of dollars? A. We have considered that question very fully, and have adopted the view that the bonus or rental paid on account of speculation should not enter into a question of this kind. While it is true that it operates against the profits, the amount needed to produce a given quantity of oil consists in the cost of drilling, the rental of the well, and the expense of lifting the oil; any other expense is

purely speculative and is incurred for the purpose of giving the individual producer an advantage.

Q. But is it necessary, in order to pursue the business, to pay this bonus or rental? Could any firm or individual become a large producer without paying a bonus or rental when the ground had only a prospective value? A. But it should appear as a bonus and not as the cost of operating.

Q. But is not the producer out that many million of dollars, equal perhaps to the cost of drilling? A. It is not compulsory, while the cost of drilling and lifting the oil is; the lease is speculative and does not enter into our figures; it curtails the producer's profits; when he sees fit to invest in that way he takes the chances.

AVERAGE DAILY PRODUCTION AND PRICE, 1870-1898.

I should like to offer here a table of figures which purports to give the average daily production of barrels from 1870 to 1898, inclusive:

but the increase in valuation of the total product was but a little over 61 per cent.

In 1871, 132,178,843 gallons of illuminating oil sent abroad brought $33,493,351, while in 1898, nearly six times as great an amount, or 771,350,626 gallons, brought but $48,343,916. The total exports of petroleum for the year 1898 amounted to 986,480,610 gallons, valued at $52,551,048. The decline during the past year (1898) reached 7,817,147 in amount, and $6,506,499 in value. For 1896, our exports of petroleum and its products were 931,795,022 gallons, valued at $62,764,278, and for 1895, 853,126,130 gallons, valued at $56,224,425.

In 1888, 680,000,000 gallons of petroleum were within $6,000,000 of the value of nearly a billion gallons exported in 1897.

PRICES OF CRUDE AND REFINED OIL, 1891-1899.

I have another paper which I wish to offer in evidence now, and which is prepared to show the comparative prices for four years before Mr. Seep's agency, and for four years after.

EXHIBIT II.—TREND OF PRICES OF CRUDE AND REFINED OIL, 1870-1898.

Year	Average daily production	Average price per barrel	Refined, per gallon	Stocks increased	Stocks decreased	Total stocks
	Barrels.			*Barrels.*	*Barrels.*	*Barrels.*
1870	15,350	$3 90	$0 26⅜	203,872	.....	544,626
1871	15,800	4 40	24¼	.....	12,626	532,000
1872	17,925	3 75	23⅝	552,223	.....	1,084,423
1873	27,106	1 80	18¼	541,134	.....	1,625,157
1874	29,937	1 15	13	2,080,462	.....	3,705,639
1875	24,075	1 24¾	13	.....	155,439	3,550,200
1876	24,505	2 57⅜	19⅛	.....	725,461	2,824,739
1877	35,988	2 39⅜	15¾	303,098	.....	3,127,837
1878	41,544	1 17⅛	10¾	1,487,463	.....	4,615,300
1879	54,206	85⅝	08⅛	3,936,956	.....	8,552,256
1880	71,114	94⅛	09⅛	8,592,848	.....	17,145,104
1881	75,004	85¼	08	8,615,947	.....	25,761,051
1882	82,338	78½	07⅜	8,574,093	.....	34,335,144
1883	63,365	1 05⅞	08⅛	1,380,421	.....	35,715,565
1884	65,129	83⅝	08¼	1,157,327	.....	36,872,892
1885	56,921	88⅜	08⅛	.....	3,333,854	33,539,038
1886	70,679	71⅝	07⅛	.....	171,140	33,367,898
1887	58,846	66⅝	06¾	.....	5,011,786	28,357,112
1888	45,058	87	07½	.....	9,752,638	18,604,474
1889	58,869	94⅛	07⅛	.....	7,699,681	10,904,793
1890	82,376	86⅝	07⅜	.....	1,609,279	9,295,514
1891	98,191	66⅞	06⅞	6,047,719	.....	15,343,233
1892	91,328	55½	0607	2,052,155	.....	17,395,389
1893	85,296	64	0524	.....	5,284,206	12,111,183
1894	84,334	83¾	0519	.....	5,774,406	6,336,777
1895	84,820	1 35¼	0736	.....	1,174,872	5,161,905
1896	92,815	1 19	0698	4,488,678	.....	9,550,583
1897	96,357	78⅜	0591	1,239,069	.....	10,789,652
1898	85,206	91⅛	0631	752,101	.....	11,541,753

Since 1870 the daily production has increased 450 per cent; the price of crude oil has declined 75 per cent, and the price of refined about 75½ per cent.

In 1871 we exported petroleum and its products to the amount of 152,195,617 gallons, and of the value of $36,663,825. In 1897 our total exports were 994,297,757 gallons, valued at $59,057,547. In other words, our exports increased over 500 per cent in 26 years,

EXHIBIT *III.*—CRUDE AND REFINED PRICES COMPARED.

On the 23d of January, 1895, there was posted in the various offices of the Seep Purchasing Agency throughout the oil regions the following important notice:

NOTICE TO OIL PRODUCERS.

"The small amount of dealing in certificate oil on the exchanges renders the transactions there no longer a reliable indication of the value of the product. This necessitates a change in my custom of buying credit balances. Hereafter in all such purchases the price will be as high as the markets of the world will justify, but will not necessarily be the price bid on the exchange for certificate oil. Daily quotations will be furnished you from this office.

"JOSEPH SEEP.

"January 23, 1895."

This marked a radical departure in the methods of buying and selling oil and determining the price of crude petroleum. It tended to make the deal between producer and refiner a direct one, and to eliminate the speculative broker as a factor in determining values. The price of speculative oil, in the shape of certificates hawked about on the floor of the oil exchanges, was no longer to rule the real market as established directly between the man who had the oil that he wished to sell in the lines and the agents of the refiners who desired to buy it. The change was rendered imperative by the gradually diminishing volume of business in the oil exchanges and the practice of some of the larger producers, who, by the purchase of a few thousand barrels of speculative oil on the floor of the oil exchanges, were able to manipulate the market a few cents in their own favor and at the same time dispose of a large amount of credit-balance oil at the advanced figures.

This order put a sudden stop to the frequent practice of establishing a fictitious value for oil by interested parties who desired to effect sales or purchases of the commodity. It, however, did not eliminate the petroleum broker or put a check on speculative dealings in oil. This business is pursued as usual, but instead of the credit-balance price being determined by the price of certificate oil, as in times past, all speculation is based upon the price paid from day to day for credit balances in the direct dealing between the producers and refiners. But the broker has ceased to be longer a factor in the business. The manifest absurdity of basing the price of the entire amount of daily production on the few thousand barrels of oil that changed hands occasionally on the floor of the oil exchange is a thing of the past.

In the following tables are shown the average price of a barrel of oil in the exchanges, from month to month, as compared with the price of a gallon of refined oil in New York, for the four years immediately preceding the time when the new rule of the Seep Purchasing Agency went into effect.

Refined prices are quoted in cents and decimal parts of a cent.

Date	Average price crude oil, per barrel	Average price refined, per gallon, New York
1891.	*Cents.*	*Cents.*
January	74⅛	7.42
February	77¾	7.48
March	74⅜	7.31
April	71	7.18
May	69¾	7.20
June	68⅛	7.13
July	66½	7.02
August	63⅞	6.70
September	58⅝	6.42
October	60½	6.45
November	59⅛	6.40
December	59¼	6.44
Average	66⅞	6.93
1892.		
January	62½	6.45
February	60	6.42
March	57½	6.32
April	57¾	6.10
May	56⅞	6.06
June	54	6.00
July	52½	6.00
August	54⅞	6.08
September	54⅜	6.10
October	51⅜	6.03
November	51⅞	5.80
December	53¼	5.45
Average	55½	6.07
1893.		
January	53½	5.33
February	57⅜	5.30
March	65¼	5.34
April	68⅝	5.52
May	58⅞	5.20
June	60¼	5.21
July	57⅝	5.15
August	58⅞	5.18
September	64⅝	5.15
October	70⅝	5.15
November	73⅞	5.15
December	78⅜	5.15
Average	64	5.25
1894.		
January	80	5.15
February	80½	5.15
March	81¾	5.15
April	84¼	5.15
May	86	5.15
June	88⅛	5.15
July	83⅛	5.15
August	80⅞	5.15
September	83	5.15
October	82⅞	5.15
November	82⅞	5.15
December	91⅜	5.61
Average	83¾	5.17

It must be remembered that the prices quoted here include the cost of the barrel. Refined oil in bulk is 2.50 cents less than the above figures. For example: In 1891 the producer realized an average of 66⅞ cents per barrel for his crude product, or 1.59 per gallon, while the refiner, after paying cost of transportation, manufacturing, etc., delivered it on board the tank steamers for export abroad at 4.35 per gallon. In 1894 the producer received nearly two cents a gallon for his crude product, while the refiner realized but 2.67 cents per gallon.

SEEP AGENCY PRICES.

The following table shows the price paid for crude petroleum by the Seep Purchasing Agency, since 1895, with the corresponding price of refined oil on the dates when changes in the price of crude were made:

Changes in price of crude oil by Seep Purchasing Agency and corresponding changes in price of refined oil at about the same date.

Date	Agency price for crude, per gallon	Refined, per gall n
1895.	*Cents.*	*Cents.*
January 23	0.99	5.90
January 24	1.00	5.90
February 9	1.03	6.05
March 8	1.05	6.60
March 14	1.07½	6.85
March 16	1.10	6.85
April 8	1.20	7.50
April 9	1.27	8.00
April 10	1.35	8 00
April 11	1.50	9.00
April 13	1.75	9.00
April 15	2.00	11.00
April 16	2.25	11.50
April 17	2.50	11.50
April 18	2.60	11.50
April 19	2.40	10.75
April 20	2.25	10.75
April 22	2.10	10.00
April 30	2.00	9.15
May 1	1.90	8.25
May 2	1.80	8.25
May 3	1.70	8.25
May 4	1.60	8.25
May 6	1.55	7.75
May 7	1.50	7.75
May 9	1.55	7.75
May 10	1.60	7.75
May 13	1.65	7.75
May 20	1.67½	8.50
May 24	1.65	8.50
May 27	1.60	8.50
May 28	1.57½	8.00
May 29	1.55	8.00
May 31	1.50	8.00
June 4	1.47½	7.85
June 7	1.45	7.65
June 18	1.50	7.65
June 19	1.55	7.80
June 21	1.60	8.10
June 29	1.55	8.10
July 1	1.50	7.95
July 5	1.47½	7.80
July 6	1.45	7.80
July 12	1.47½	7.65
July 15	1.50	7.65
July 19	1.52½	7.65
July 25	1.45	7.65
July 26	1.37½	7.65
July 27	1.30	7.65
July 28	1.25	7.10
November 5	1.30	7.25
November 7	1.33	7.25
November 11	1.38	7.75
November 12	1.40	7.75
November 13	1.42	7.75
November 14	1.45	8.50
November 15	1.48	8.50
November 16	1.50	8.50
November 21	1.55	8.25
November 27	1.50	8.00
November 29	1.47	7.75
November 30	1.45	7.75
December 2	1.40	7.50
December 5	1.38	7.50
December 10	1.43	8.00
December 11	1.48	8.00
December 12	1.50	8.00
December 19	1.47	8.00
December 20	1.40	7.75
December 21	1.35	7.75
December 24	1.40	7.75
December 27	1.45	7.75
December 30	1.50	8.00
1896.		
January 2	1.50	8.00
January 17	1.47	8.00
January 18	1.45	8.00
January 20	1.43	8.00
January 22	1.40	7.65
January 31	1.43	7.60
February 18	1.40	7.35
February 20	1.35	7.10
February 24	1.33	7.10
February 26	1.30	7.10
March 4	1.28	7.10
March 9	1.30	7.10
March 10	1.33	7.25
March 12	1.35	7.25
March 14	1.38	7.25
March 17	1.40	7.50
March 23	1.37	7.50
March 25	1.35	7.35
March 26	1.32	7.35
March 27	1.29	7.20
April 2	1.25	7.20
April 7	1.22	7.20
April 9	1.20	6.90
April 24	1.25	6.95
May 11	1.22	6.80
May 14	1.20	6.80
May 18	1.17	6.70
May 19	1.15	6.60
May 22	1.13	6.60
May 25	1.10	6.60
May 26	1.09	6.55
June 5	1.10	6.65
June 10	1.14	6.90
June 12	1.16	6.90
June 15	1.18	7.00
June 16	1.20	7.00
June 23	1.18	6.90
June 24	1.16	6.90
June 25	1.15	6.90
July 13	1.13	6.80
July 14	1.10	6.75
July 15	1.07	6.65
July 16	1.03	6.50

Date	Agency price for crude per gallon	Refined per gallon
1896.	*Cents.*	*Cents.*
July 23	1.06	6.60
July 27	1.08	6.60
July 31	1.06	6.65
August 12	1.04	6.65
August 27	1.06	6.70
August 31	1.08	6.75
September 4	1.10	6.80
September 10	1.12	6.85
September 23	1.15	6.90
September 25	1.18	6.90
October 1	1.16	6.90
October 13	1.14	6.90
October 27	1.17	7.00
November 10	1.20	7.15
November 18	1.17	6.90
November 19	1.15	6.80
November 23	1.13	6.70
November 24	1.10	6.60
November 27	1.08	6.60
November 30	1.05	6.50
December 7	1.03	6.50
December 9	1.01	6.50
December 14	.99	6.40
December 16	.97	6.30
December 17	.95	6.25
December 23	.93	6.25
December 28	.90	6.20
1897.		
January 1	.90	6.20
January 18	.88	6.10
January 23	.85	6.00
February 1	.87	6.05
February 2	.90	6.15
February 15	.91	6.25
March 22	.92	6.35
March 23	.93	6.40
March 24	.94	6.45
March 26	.95	6.50
March 30	.96	6.55
April 3	.93	6.55
April 5	.91	6.20
April 5	.88	6.20
April 9	.85	6.05
April 15	.84	6.05
April 28	.83	6.05
April 30	.81	6.05
May 3	.83	6.15
May 5	.86	6.25
May 18	.89	6.35
May 28	.87	6.15
June 24	.85	6.15
June 28	.83	6.10
June 29	.82	6.05
July 2	.80	6.00
July 13	.79	5.95
July 14	.77	5.85
July 19	.75	5.75
July 26	.73	5.75
August 2	.71	5.75
September 9	.69	5.70
September 23	.70	5.80
October 14	.68	5.50
October 15	.67	5.50
October 18	.65	5.40
1898.		
January 1	.65	5.40
February 16	.67	5.40
February 17	.68	5.40
February 23	.70	5.50
February 25	.73	5.60
February 26	.76	5.85
February 28	.80	6.20
March 1	.82	6.05
March 8	.80	5.90
March 9	.79	5.90
March 14	.78	5.80
March 17	.77	5.75
April 2	.75	5.75
April 21	.74	5.60
April 22	.72	5.60
April 23	.71	5.60
May 5	.75	5.80
May 6	.80	6.00
May 7	.85	6.00
May 11	.83	6.00
May 12	.82	5.95
May 19	.84	6.05
May 20	.86	6.15
June 7	.87	6.15
June 11	.86	6.15
June 15	.85	6.15
June 21	.86	6.15
June 22	.87	6.15
June 24	.89	6.15
June 27	.90	6.15
June 28	.92	6.25
July 11	.94	6.25
July 19	.95	6.30
July 20	.93	6.20
July 21	.92	6.20
July 22	.90	6.10
July 25	.92	6.20
July 26	.94	6.30
July 27	.96	6.40
August 15	.97	6.40
August 18	.98	6.50
August 22	1.00	6.50
September 16	1.02	6.50
September 23	1.04	6.75
September 27	1.06	6.85
September 29	1.05	6.85
October 4	1.07	6.95
October 6	1.08	7.00
October 7	1.10	7.10
October 13	1.12	7.20
October 17	1.15	7.30
October 20	1.18	7.40
November 15	1.16	7.30
November 16	1.15	7.30
December 9	1.17	7.30
December 19	1.19	7.50
1899.		
January 1	1.19	7.50
January 12	1.17	7.40
January 13	1.16	7.40
January 30	1.15	7.40
February 28	1.13	7.35
June 28	1.15	7.20
June 30	1.17	7.35
July 6	1.19	7.40
July 11	1.21	7.50
July 14	1.23	7.60
July 18	1.25	7.70
July 31	1.27	7.80
August 29	1.30	7.90
August 31	1.35	8.10

When there has been a large amount of surplus production seeking a foreign outlet, reduced prices have been the invariable result for both crude and refined. Increased consumption is always gained at the ex-

pense of price. Foreign competition has been keen, and prices for refined for four years from 1891 to 1895 were hammered down to the lowest notch. When refined oil gets above acertain price per gallon, its use becomes almost prohibitive to millions of our foreign consumers. The result of higher prices is immediately shown in a falling off in the foreign demand.

A careful inspection of the above tables will show that the relative ratio between the price of refined and crude oil has been better maintained during the years that the practice of basing prices upon the actual conditions of supply and demand has prevailed than during the years immediately preceding the adoption of the new order of things. The speculator devoted his efforts to bearing the market whenever there was any immediate prospect of a temporary increase in new production. without any regard to the foreign demand for refined or the actual value of refined oil in the markets of the world. The producer was absolutely at his mercy.

Taking the year 1889 for illustration, it will be observed that the price of refined oil has advanced from 7.50 cents per gallon at the beginning of the year to 8.10 cents at the present time, a gain of 60 points. During the same period the Seep Purchasing Agency price for crude oil has advanced from $1.19 to $1.35 per barrel, or 16 cents. During March and April, when crude oil was $1.13 per barrel, refined dropped as low as 6.95 cents per gallon. On June 28, when refined had advanced again to 7.20 cents, crude oil was marked up to $1.15, and a few days later, when refined had advanced to 7.50 cents, the crude oil price had been raised to $1.21 per barrel.

HOW THE PRICES OF OIL ARE FIXED.

Q. (By Mr. Phillips.) You say "it tended to make the deal between producer and refiner a direct one;" but does the producer have any part in the bargain? Do they not post the price each day that they will give? Can it be considered a deal when the producer has nothing to do with fixing the value of his commodity? A. Would you suggest that I say "option"—that the producer has the option? Would you advise me to change that?

Q. Provided he has another place to sell. A. He is not driven to that necessity. When he becomes reduced to that necessity, it may be as you say.

Q. When the Seep Agency advanced prices, as they did lately, did not the Standard advance the refined 10 or 15 hours later, the same day or the day following? A. I have no knowledge of that, but I dare say refined would go up in proportion to the advance in crude.

Q. They fix both prices, the crude and refined? A. Mr. Seep states here that the markets or the demand of the world fix it. We are giving Mr. Seep's version of it.

Q. (By Mr. Farquhar.) Does Seep post the European market? A. No.

Q. What market does he post? A. The crude oil market.

Q. Of America? A. Of the United Pipe Lines and the National Transit Company.

Q. (By Mr. Jenks.) You speak of the export price fixing the price of all oil and of the markets of the world fixing the prices when Mr. Seep is purchasing. Is it true that the relation between the regular export price in New York and the price Mr. Seep is paying the producer is a constant one? A. I believe it is.

Q. You think the relation between these two prices is substantially the same all the time? A. Inevitably. The purpose of this paper is to lead up to that question.

Q. (By Mr. Phillips.) Did not the Standard Oil Company completely control the price of oil four years before the Seep Agency? What does the statement that they "would pay what the markets of the world would justify" mean? Was there sufficient business done on the exchange by others to affect the Standard in any way? A. To affect prices, there was.

Q. To any considerable extent? A. To an extent sufficient to influence the market one way or the other. I have an instance in mind now of a gentleman coming to Oil City and advancing the market two cents by dumping on it a half million barrels of his own oil.

Q. Was that a common practice? Did not a brief period of time elapse in that transaction? A. It was just an instance of marvelous mention, you might say.

Q. The gentleman only had time to walk from one place to another? A. He took that time.

Q. (By Mr. Kennedy.) Who was that gentleman? A. Mr. Michael Murphy.

Q. (By Mr. Smyth.) That was a case of pure speculation? A. Yes. It was possible for anyone with money and nerve and oil to do the same thing any time.

Q. (By Mr. Phillips.) It would be risky for a producer to pursue that course, would it not? A. I would not want to be the man to try it.

BY-PRODUCTS AND THE PROFITS OF OIL REFINING.

Q. Is it fair to compare the price of crude oil with that of export oil to show what the profits are, without taking into consideration the by-products, such as lubricating oil, which is sold in this country and other places? A. That question has occurred to my mind a number of times, and the conclusion I have arrived at is that when we have an article of export or commerce the foreigner makes the price; Manchester fixes the price for cotton; Liverpool for wheat.

Q. Does the foreigner make the price of oil in Denver, Minneapolis, and the southern cities and towns? A. If oil could be transported by telephone, or placed there without labor, it would be sold as cheap in Denver as in New York; but since labor enters into it, the oil at Denver is produced at Denver and the eastern oil is brought into competition with it.

Q. Does not the Standard make a very large profit out of the by-products—benzine, tar, lubricating oil, etc.—which you do not take into consideration when simply comparing the price of refined oil with what they pay for crude? I may be misinformed or mistaken; what is your view in regard to that? A. Well, the way it has always appeared to me is this: The by-product is something of a gift of nature. In marketing the by-product labor and capital have been employed; the producer has nothing to do with these by-

products; he sells his product as a whole, and they are only created by labor in the process of manufacture or by chemical process. In other words, they cost something; they possibly cost something near as much as they produce in many instances, but that there is a profit is very complimentary to the refiner and to the chemist who has made it possible. There was a time in the refining business when there were no by-products. The only by-product that I know anything about when I went into the oil business and that had a ready market was benzine. That was sold as a dissolvent for paraffin, went into the wells as benzine, came out and went into the producers' tanks, and was sold back to the refiners as crude oil at 400 and 500 per cent over cost. Now, that is the only by-product that we had in the beginning. Chemistry has advanced the art of refining, and at every step labor and capital are employed in the preparation of by-products, and I dare say there is a profit. There should be a profit in them.

Q. Well, provided there is a profit, and you admit that there is and a large one, in the by-products now, is it fair to take the price of the refined export oil and compare it with the price of the crude? In your opinion are not the by-products the source of one-half the profits of the Standard Oil Company or other people engaged in shipping oil abroad? A. Well, it occurs to me that with the profits on oil at export prices, we should have no oil business, because with the production of the present volume no refinery could undertake to carry on the business and run it for the profits on burning oil alone. The oil would necessarily be so high that there would be no inducement for the consumer to buy it. It has been stated here in my presence by some person on the stand that ten cents a barrel was a fair profit, but he was taking into consideration the by-product. No refiner can take ten cents profit, and that alone.

Q. (By Mr. Farquhar.) Does not the Standard Oil Company dispose of the by-product to other manufacturers? For instance, is not the petroleum residuum which enters into dyes sold at a cheap rate to manufacturers outside of the Standard Oil Company? A. Yes.

Q. And in the long run it makes very little difference in the tables you have presented here in respect to the crude oil itself? A. That would be my view of it.

Q. Do you know whether the Standard has entered into the manufacture of by-products such as dyes, magenta dyes, and others, or is that done by different corporations and individuals who have taken up the by-product business? A. By separate concerns.

Q. (By Mr. Phillips.) How about the paraffin or wax that enters into sperm candles; do they manufacture the paraffin or wax? A. There is a large percentage of wax and they sell wax to other manufacturers.

THE PRODUCERS' PROTECTIVE ASSOCIATION BUILDS REFINERIES.

The volume of matter involved in this subject is so great that I have necessarily skimmed over it. The complete examination of this subject would require more time than the commission can give to any one witness. Therefore, we have jumped from the movement in the 70's to the present time, but I should like to go back now to the shut-in movement and the matters growing out of that. After that period of 12 months' suspension of operations the Producers' Protective Association continued in force, and their next step was to promote the erection of refineries in competition with their benefactor, the Standard Oil Company.

Q. Did you not say that was a mutual arrangement? Were not the producers at liberty to do as they pleased after that? A. That agreement was carried out for one year; it was limited to one year, and at the expiration of that time the parties did as they agreed; their mutuality ceased. They fell apart. The Standard Oil Company pursued its course as a transporter of oil. The Producers' Association, as an inducement, that there was so much profit in the by-products that they could afford to give the burning oil away. A refinery was built on that proposition by impractical men and failed. There was no reason why a refinery where it was built should not have succeeded; there is one there now in successful operation.

Q. How many were built after that shut-in period? A. Only one.

Q. Were there not a large number before, called independent refineries, which united their interests? A. Yes.

Q. The producers did not spend money in building refineries? They supplied the money to build that one refinery.

Q. No large per cent of it? A. It was contributing financially.

THE ORGANIZATION OF NEW PIPE LINE COMPANIES.

Q. Had they a right to do that? A. They had a perfect right to do it; but, to show the object of the organization still further, they proceeded about 1890 or 1891 to organize pipe line companies. The first company organized was the Producers' Oil Company, Limited, with a capital of $600,000. No one questions their right to do that. It was organized at a very opportune time, at the period of the greatest production that has ever occurred—the opening of the McDonald field. They entered the McDonald field, but they got away from the production that was likely to be overwhelmingly large. They kept on the outskirts and limited themselves to such wells as they could handle with their capacity. That was the first point where they entered actively into competition with the United Pipe Lines in the transportation of oil. At this time the McDonald field rose within three months from practically nothing to a daily production of 80,000 barrels, and the production was limited to a territory about six miles long by two miles wide, a very narrow strip for so large a production. That flow continued for but a single day, but the average was above 60,000 barrels a day for months. The Producers Association, which had been formed for the betterment of the oil trade, did nothing to improve the condition of the McDonald producer. It gave him competition at once useless and exppensive—expensive

to the extent of $600,000 of the producers' money embarked in it, which has never paid a cent of interest from that time to this. The one concern was obliged to shoulder the entire responsibility for carrying the oil in that district, and would have done so regardless of the presence of the association of producers.

INTEREST OF THE STANDARD IN THE PRODUCERS' OIL COMPANY, LIMITED.

Q. Did not the Standard Oil Company purchase a large percentage, a majority, of the stock in the Producers' Oil Company, Limited, of that $600,000 capital of which you speak? A. I know of some purchase by Colonel Carter.

Q. Did not that find its way to the Standard Oil Company, and in the suit pending was it not proven that the Standard Oil Company furnished the money to purchase the majority of that stock? A. I did not understand it so, but I do not know.

Q. Did they not pay as much as two for one in order to get control? A. I have no information on that. The only sales I know of were at par; I know of some few sales at par.

Q. Was that a direct corporation, or what was the nature of the organization? A. It was a limited partnership.

Q. Mr. Carter attempted to be elected a director in it, did he not? And is it not a fact that the matter was taken into the courts with the result that it was decided that he could not become a director or have the power to vote that stock, and that therefore he failed to secure control of the company? A. I know there was a suit and a decision.

Q. You do not know that the decision was adverse to Mr. Carter or the persons who stood back of him? A. I presume that it has been from the subsequent proceedings.

Q. Are they not now appraising the value of that stock? A. I understand they are now appraising the value of the stock. The Producers and Refiners' Oil Company, Limited, proving ineffectual for the purpose intended, obtained additional capital through a combination with refiners to the amount of $250,000. That has never paid a cent of dividend. It has been in operation nine years and has never paid a cent to the stockholders. The market price of oil has ranged from one to nine cents higher per barrel in that line as compared with the Seep Agency prices. The producers got the benefit of that. Yet the refiners to whom the oil was sold paid the existing market price, or a price less than the one paid to the producer.

THE ASSOCIATION CONSTRUCTS A PIPE LINE TO THE SEABOARD.

Q. Was there another line built after the second one to which you refer? A. The United States Pipe Line was built to the seaboard.

Q. By whom? A. By the same association. A million dollars was embarked in that. Other capital was added to that, probably four or five hundred thousand dollars, making upwards of $3,000,000 invested in transportation as a result of that movement, and upon which the stockholders have never received a dollar excepting a five per cent dividend paid by the United States Pipe Line at a time when it was paying nothing on its fixed indebtedness.

Q. Do you not believe that they would have reaped a large profit had it not been for the opposition of the Standard? A. Not at all. I believe that investment was useless, the capital wasted, and the producers wronged.

Q. When this company commenced to sell refined oil in New York city did not the Standard put the price down there to less than the cost of refining? A. Whatever was done there, was a matter of merchandising on both sides. They were not producers or refiners—they were merchants.

Q. Did they not do the same thing in Philadelphia? A. I believe that to be a common practice wherever there are sales. Each person having a commodity for the market places it at the best advantage to himself.

SELLING AGENCIES ESTABLISHED IN EUROPE.

Q. Did they not obtain a market in Europe and establish a selling agency there? A. I was leading up to that.

Q. Did not the Standard buy up that agency and obtain all the tanks available in Germany and leave the independents without a chance to market their oil? Did they not buy out a man by the name of Poth, who was handling the independent oil abroad? A. I understand they did.

Q. Was not the agency sold before his death? A. I know nothing about that; I cannot answer that question.

Q. Have you any knowledge of that? A. No; I have no knolwedge of it.

Q. Do you know that the Pure Oil Company, as it is called, built storage tanks abroad and established agencies of their own? Are they now doing business in that way, independent of the Standard's opposition, and where they cannot be discriminated against in prices? A. I know of the existence of the concern called the Pure Oil Company.

THE PRODUCERS' ASSOCIATION BECOMES A TRUST.

Q. You do not know then that these companies have established agencies abroad and are now marketing their oil? A. Oh, yes; that is a matter of common information; but I was about to say that when the Producers' Protective Association started in to protect their business in an associated way I suppose they were incorporated. They started out with the pipe line, under an arrangement in which they could limit their responsibility and say who they would admit to partnership. That being ineffective they formed a combination of refiners and secured $250,000 additional capital. Then came the construction of the United States Pipe Line, and after that the establishment of the Pure Oil Company. But the Pure Oil Company did not come out until after the Oil League was formed and it became necessary to complete the trust. This thing in a most untrust-like way, but ended up in a trust as

complete as could be formed. The creation of the Pure Oil Company was necessary in order to control all these other properties. The Pure Oil Company, with the nominal capital of $1,000,000, and an actual capital of $400,000, is trying to swing this $3,000,000 concern, and will eventually if the voting trustees have the power.

Q. (By Mr. Jenks.) Will you explain the evolution of that trust a little more in detail? A. That is a trust.

Q. Explain just what you mean by that. Do you refer to the method of its formation?

Q. (By Mr. Phillips.) Do you mean a trust or a combination?

Q. (By Mr. Farquhar.) With respect to the form of control you regard it as a trust? A. In that respect I regard it as a trust. It is a combination, a series of combinations, but the properties are all managed by voting trustees. The property is a trust; three-fourths of the property of the United States Pipe Line, or the proportion which this organization controls, is in a trust.

Q. (By Mr. Phillips.) Do you know the reason why a voting power was put there? Had not the Standard bought several hundred thousand dollars' worth of the stock of the United States Pipe Line and did they not propose to control it? Was it not essential to the existence of the United States Pipe Line that the stock should be put in a trust? A. If we start by admitting that proposition we must endorse all that has been done before in the way of combination; that of itself is a virtual admission that the Standard Oil Company was right.

Q. (By Mr. Farquhar.) You mean to say that this action of the company has vindicated the action of the Standard Oil Company? A. Entirely.

THE PRODUCERS' ASSOCIATION COPIED THE METHODS OF THE STANDARD OIL COMPANY.

Q. (By Mr. Smyth.) You consider that this company copied in a measure the plans and proceedings of the Standard Oil Company? A. Not exactly; that was open; this is secret.

Q. (By Mr. Phillips.) Do you mean that the Standard Oil Trust was not one of the most secret organizations in existence in the management of their business and in making statements to the stockholders? A. I suppose they have not opened the pages of their books to the public.

Q. Have they ever issued any statement to the stockholders? A. Not being a stockholder, I can not say.

Q. You are a newspaper man? A. They have never issued any to me; I have never asked for any.

Q. Was suit ever brought by a stockholder in that trust in order to get knowledge of their business and to have a statement made of how the funds were being handled? A. I think the suit failed, and properly, because the purpose of the suit was to work an injury to the company. It was not brought in good faith.

Q. Then you think that a man holding stock in the company has no right to know anything about the amount being earned or whether or not its means are being squandered? As a rule, do other corporations exist without making a statement to their stockholders? A. If the act of the Pure Oil Company in excluding Colonel Carter is justified, I do not see how other concerns can be censured for what they have done.

THE INDEPENDENT OIL MOVEMENT HAS NOT REDUCED PRICES OF REFINED OIL.

Q. (By Mr. Jenks.) What has been the effect of the independent oil movement upon the prices of refined petroleum to the consumers? You state that these various independent organizations that were compelled to go into a trust made no profits and declared no dividends, and that you regard the investment of that money as a practical waste, because they had been of no service to the oil producers? A. Yes.

Q. What has been the effect of this independent movement on the prices of refined petroleum? A. It has had no effect whatever.

Q. You do not think it resulted in reducing the prices of petroleum at all? A. None whatever; it only gave the members of this company and the independent refiners in the creek regions the opportunity to get immensely wealthy. They are making money faster than ever before. The producers are making a little more money than previously, to the extent of the premium which the producers will not pay the patrons, and the stockholders receive nothing for their investment.

EFFECT OF THE MOVEMENT ON THE PRODUCERS.

Q. Do you know how far the stockholders of these combinations are themselves producers? A. A very large per cent are producers.

Q. Do you know what proportion of the producers whose oil they are buying are themselves stockholders? A. I do not .

Q. Then you would say that the general result of this independent movement has been to increase the price of crude oil? A. Only to a very few, to persons interested in that line and connected with its service.

Q. To others, too? A. To others, no; its effect has not been felt to any extent anywhere.

Q. Does it benefit all of those whom it reaches? A. To that extent and by this means: It is a method of "robbing Peter to pay Paul." It is taking money out of the pipe line to pay the producer in the way of advanced prices for his oil; it performs its service by piping oil for less than published rates or established rates, whatever they may be.

Q. What is the rate? A. The pipeage rate is understood to be 15 cents a barrel. Now, when the premium has been as high as 9 cents a barrel, that would mean as much as 9 taken from 15, leaving the pipeage charge 6 cents.

EFFECT OF THE INDEPENDENT MOVEMENT ON REFINERS.

Q. I understood you to say, further, that this independent movement had resulted in making refiners in that region rich? A. It did.

Q. Will you explain how that was brought about? A. If I could, I would be in the refining business myself.

Q. You think it has not resulted in the lowering of the price of refined oil? A, No; they claim that their success has not resulted in the lowering the price of refined oil, not in the region, at least, where we are. That oil which goes abroad is restricted in every State of the Union.

Q. (By Mr. Phillips.) That is, both as to the Standard and to the others? A. Yes; it is necessary by reason of the laws of this country.

Q. Are not these companies now making money? A. The refining companies?

Q. The independent refining companies. Would not their stock be very desirable at the present time? A. The refiners' stock?

Q. No; the stock of these various independent companies? A. It would be if they managed on business principles. I believe there is money in piping oil if the business is run for the benefit of the lines, for the plant itself. There must be money in it.

Q. Did they not establish the first pipe line to the seaboard to handle refined oil? A. That cuts no figure. Warren, as we have shown here, piped refined oil a distance of three miles in 1865, and in tank cars they have taken refined oil from one point to the other. And what is a tank car but a pipe line on a limited scale? If you confine oil in an iron vessel, it makes no difference whether it is a continuous pipe line or in a closed tank and agitated, the result is the same.

THE OPPOSITION MET BY THE NEW COMPANIES.

Q. Would not these companies have gained a good deal more if they had not been opposed by combinations in New Jersey and could have gotten through to New York? Would not their profits have been much larger if they had had free pipage through to New York, as the Standard Oil Company had? A. If there was only one proposition, a person might answer that.

Q. Have others the same right to go through to New York that the Standard Oil Company has? A. Undoubtedly they have the right.

Q. And is it fair or just that they should be prohibited from exercising that privilege of equality? A. Let me answer that by comparison in this way: I think it would be just as fair as for one of two producers bidding for land to outbid the other and take the land away from him. If it is unfair to prevent a pipe line from going into a market already occupied, it is unfair for one producer to compete for land and take it from another if he has, with his neighbor, superior wealth and ability to control it.

Q. One is exercising the right of eminent domain? A. And he is performing for that right an adequate service to the public.

Q. Would you say, if one railroad could supply the whole market of New York, that all other railroads should be prohibited from going there? A. If the money to construct those roads was to come from the passengers who were expected to patronize them and then to pay their fare, too, I should say yes.

Q. Do you undertake to say, then, that these independent companies which the Standard is so anxious to control, and in which they have purchased stock which would sell today at a very large profit, are robbing their people or doing an injustice? A. "Robbing" is a hard word, and I do not care to use it in any connection. The fact remains that the money embarked in the enterprise is unremunerative.

Q. You stated they were taking money from some person and giving it to others? A. That was only a comparison; just a remark. That is a very common expression: "Robbing Peter to pay Paul."

Q. You have no direct knowledge of these people having done an injustice to any of the stockholders, have you? A. I have no knowledge that they have done full justice to the stockholders in returning them interest on their investment in the pipe lines. I have no knowledge of that kind. There are $3,000,000 invested in that enterprise.

Q. You have no knowledge of the fact that they have been employing every honorable means to get through to the city of New York, and that they have lessened freight rates a very great deal by getting into New Jersey, have you? A. I have; yes.

Q. (By Mr. Jenks.) You have said that you do not think the independent movement has reduced the price of refined oil. What has been the price of water-white oil for the last few years, since the organization of the independent companies, as compared with what it was before? A. I have no means of knowing; we do not have water-white oil in export. In the sale of water-white or any other class of oil there is a special contract, according to the district or location.

Q. You have no record at all with regard to the price since 1874? A. None at all.

Thursday Morning, September 7, 1889.

THE SEEP PURCHASING AGENCY.

Q. (By Mr. Jenks.) During the session yesterday you spoke of Mr. Seep as being the general purchasing agent. Whom does Mr. Seep represent Is he the general purchasing agent for the Standard Oil Company? A. I so understand it.

Q. So he receives his instructions from the New York office? A. I do not know from whom he receives his instructions; he acts independently so far as my knowledge extends.

Q. He is supposed to represent the Standard? A. Yes.

Q. Whether he fixes his prices of his own accord or whether he receives direct instructions from some superior official of the Standard Oil Company you do not know? A. I do not know.

Q. Is he a general purchasing agent with other agents under him? A. That is the way I understand it.

Q. You understand that he fixes the prices for his different subagents throughout the oil regions? A. That is my understanding.

Q. Have you any idea as to the number of subagents

he has under him? A. I have an idea; the number is very large, probably twenty or thirty.

Q. You do not think the number of agencies runs into the hundreds? A. Oh, no; I do not think that; 20 or 30 will include them all.

Q. How large a portion of the crude oil produced is purchased through Mr. Seep and his subagents? A. I should think about 80 per cent.

Q. Is that for the whole field, the Ohio, Pennsylvania, and West Virginia oil? A. I can testify only as to Pennsylvania oil.

Q. Have you any information with reference to the Ohio oil? A. I think that estimate would hold good as to Ohio.

Q. The agencies there are under his control also? A. So I understand.

Q. Mr. Seep, then, in posting prices that he will pay, is practically doing so for 80 per cent of the oil that comes into the market? A. I think about that.

FLUCTUATIONS IN THE PRICE OF CRUDE OIL EXPLAINED.

Q. In posting the prices he will pay for crude oil from day to day, are the fluctuations by the barrel very large or are they only a cent or two? A. Well, I do not know as to that; I pay but very little attention to the oil market. The fluctuations are usually a full cent at a time; sometimes a fraction of a cent.

Q. That is a barrel? A. A barrel. It has been two cents; it may have been higher than that at times.

Q. Do you see any satisfactory reason why, on a barrel of oil, fluctuations should be so small as that? Are there any special causes that affect the market in such a delicate way? A. Now that question has occurred to me, and I think I have spoken to one or two persons about it, and the reason I have heard assigned is this: They have adopted the point system on refined oil, and the point system is a very delicate fluctuation; for example, 10 points in oil may represent a fraction of a cent or a full cent, and that would account for the margin on the amount you stated; it is controlled in some way by the movements of refined and the fluctuation of refined is by points, 100 points representing a cent, and it is the fraction of 100 that controls the prices of the crude.

Q. So in your judgment these minor fluctuations that Mr. Seep makes are controlled by the fluctuations of the refined? A. Yes.

HOW THE PRICE OF REFINED OIL IS DETERMINED.

Q. The prices of refined are presumably fixed by the Standard Oil Company in New York? A. As I understand it, they are fixed by the demand in Europe.

Q. There must be somebody who has oil to sell and who determines the selling price? A. The parties holding the oil would have the option of relinquishing their holdings at the existing price, but to make the price, as you put the question, would imply that the Standard chalked the price up, and said to Europe: "You must take this or none at all." That is not the situation, as I understand it. The pulse of the market is carefully felt in Europe constantly, and the market is made to suit the demand there.

Q. The point I had in mind was this: Is it some official of the Standard Oil Company who determines what price shall be accepted for the oil they have? A. There is undoubtedly some salesman connected with their establishment who is in direct connection with the prices at some point. The condition of the market is known to this person, and if he wants to relinquish the oil at that figure it goes.

Q. Then if the price of the crude oil that is bought by Mr. Seep varies with the price of refined oil, would there be a presumption that the two are connected? Would the prices then presumably be fixed by Mr. Seep? A. The price of crude oil is invariably controlled by the price of refined. When there is a variation in refined, amounting to points enough to make a fraction of or a full cent, it appears in the crude.

Q. (By Mr. Phillips.) Is it not the case frequently that they advance the crude before the refined, or is not the one advanced the same day the other is? Was not that the case with the recent advances, the crude oil being first advanced and the points afterwards named on refined? A. I am not clear as to that, and I will say furthermore that I am not personally familiar with the movements of refined oil.

Q. (By Mr. Jenks.) Yesterday I asked you with reference to the price of water-white oil, and you said that the regular prices of oil were the prices on export oil? A. The prices quoted.

Q. Quotations on refined oil are made in Pittsburg, New York, and other places, are they not? A. Yes; those are local market quotations, and they pay no attention to local markets; the general market is the one that controls the price of crude.

PRICES OF OIL IN CINCINNATI, 1865-1877.

Q. In your paper you pay no attention to these markets, Pittsburg or New York? A. I pay no attention to them; but in connection with that question I hunted up some figures gathered back in 1865. They consist in a series of reports of the Chamber of Commerce of Cincinnati from the year 1865 on into the seventies. Now, this gives the local market and not the export:

[Report of the Cincinnati Chamber of Commerce for the year ending August 31, 1865.]

The price of this article, owing to the decline in the price of gold, was much lower at the close than it was a year ago, though the average price is higher for the year than that of the previous season. There has been a marked falling off in the production of the article, according to the statistics of the commerce of the country.

The following was the price of refined petroleum, per gallon, duty paid, at the close of each month during the year 1865:

	Cents.		Cents.
September 28	85	March 29	83
October 26	85	April 26	73
November 30	88	May 31	70
December 28	93	June 28	70
January 25	92	July 26	70
February 22	93	August 30	70

The following were the imports of petroleum, including coal oil, of which but little is now brought to market, the last four years:

	Barrels.		Barrels.
1861-62	23,000	1863-64	49,031
1862-63	20,000	1864-65	50,925

The price of this article has been very low during the entire season, but did not undergo much change. The supply has been larger than the previous year, as is shown by the statistics of the trade, there being an increase in the foregoing exports from New York alone of over 7,000,000 gallons. Previous to July, 1868, there was a tax of 10 cents per gallon on refined; since that time it has been free of that tax, so that in comparing the prices given this must be remembered.

Q. Have you facilities for obtaining, conveniently, the prices of water-white oil at Pittsburg or New York, covering the same period as those of export oil? A. Not any more than the commission itself. These figures, I should say in explanation, were obtained some years ago when I was making an investigation into the movement of oil. The Cincinnati Chamber of Commerce seemed to be the only one that had given attention to it and kept a record from 1860 to 1869, and up to the present time.

Q. You think that Cincinnati would be as fair a point as could be chosen in determining the price of water-white oil? A. It is the only point at which a correct record has been kept, a correct record of the prices of all commodities.

Q. I understand you to say that the prices of water-white oil in these local markets do not vary with the prices of export oil? A. I said it was a matter of special contract in the various markets where it was offered. I do not know that I can add to that because, in the various cities, the prices have varied according to the quality of the oil; but water-white, as a standard quality, is always water-white wherever it is offered; the elements that enter into that are transportation; it may cost more to sell in Ohio than it does at the point of manufacture, if it is manufactured in Pittsburg.

Q. Certainly. If we could find one standard market where they have kept a record of the prices of water-white oil from, say, the early seventies or sixties up to date, would that, in your judgment, show us fairly well what the effect of the combination has been upon the American consumer? A. It undoubtedly would; it would show you the trend of prices—what the American consumer has been obliged to pay.

Q. You think a record of that kind would be fair to all parties concerned? A. Yes.

Q. Fully as much so as the record of export prices? A. Fully as much so as the export prices, taking into consideration the difference in the quality of the oil.

Q. From what you have said I infer that you believe that a great many elements come in to affect local prices that do not affect export prices. A. Undoubtedly.

Q. For example, home competition? A. Well, and a better quality of oil; the higher the grade of oil the more the cost in manufacture, transportation, and other things besides competition.

Q. But if we were to take some one market and keep a record, comparing prices there with the price of crude oil, you would consider that a fair test? A. Yes; and I believe Cincinnati would be as fair a market as you could get.

Q. (By Mr. Phillips.) Would that be a fair test if there was no competition in Cincinnati, and there was no other market? A. Undoubtedly. Competition has very little effect in regulating prices through a long series of years. You take a series of thirty years and competition has very little to do with it; it will go down to a stable price, and that must be a remunerative one for the people to remain in the business.

Q. Taking a period of thirty years, as you have suggested, do you suppose competition would appear there on the whole, as it would in, let us say, New York and Pittsburg? A. I have no reason to doubt that it would.

THE ESTABLISHMENT OF OIL EXCHANGES.

Q. (By Mr. Farquhar.) When was the first oil exchange established in this country? A. Well, from the various records we have, it would be about 1871; that is, an oil exchange for handling business, as we now understand it.

Q. (By Mr. Jenks.) That was at Titusville? A. That was at Titusville in 1871. There were exchanges before that

Q. (By Mr. Farquhar.) What was the character of the exchanges before 1871? A. The exchanges then were something like the Chamber of Commerce, where persons engaged in the business would call and exchange views. It was a meeting ground.

Q. How many exchanges were established in the country? A. At one time I think there were no fewer than twenty.

Q. When was the New York exchange established? A. I think about 1880; but we can determine that exactly.

Q. I want to find out who the speculators were that fleeced the public on oil. A. On May 2, 1877, I have a record of the petroleum exchange being opened in New York.

Q. How long did that exchange exist? A. That or its successor is in existence to-day.

Q. What is the character of the exchanges in New York now with respect to oil? A. Oil is dealt in in futures now. They speculate on the value of oil a month or a year ahead.

Q. The same as in cereals? A. That is the method of speculation now. But dealing in futures is only of recent date.

Q. (By Mr. Phillips.) Is there any considerable amount of speculation now of the kind to which you refer, compared with what there was 15 or 20 years ago? A. It is very small in comparison.

Q. (By Mr. Farquhar.) What is the character of the business in the oil exchanges in the oil country itself, in Oil City? A. There were two elements in the trade, one interested in high prices and one in low. The bears had a decided advantage. Through the existence of a very large stock of oil it was possible to sell along in the later seventies and early eighties and never cover. Oil could have been sold short there to get the carrying rates; brokers became rich on selling wind and got the carrying rates —all that wind, and never covering. The effect of that was to depress the prices to producers. The larger producers took a very pronounced stand against that sort of trading in the oil exchanges. It was denounced severely in their meetings and in letters to the press.

Q. Who are the supporters of the oil exchanges? A. They are generally called "lambs"— that means the public, you know; the people who come from the outside and bet on the price of oil and generally lose.

Q. Were the producers, as well as the refiners and all others, interested in this speculation? A. Undoubtedly they were—producers, merchants, laborers, and clerks.

Q. So it was a free field for a while, in an oil exchange, for people who took their chances in speculation? A. Yes.

Q. Have you any idea of the losses to the public resulting from that speculation? A. I have never heard an estimate of that, but if I were asked to make one myself I should think one hundred millions of dollars would not be too high.

POSITION OF THE STANDARD AND THE PRODUCERS' ASSOCIATION WITH REGARD TO SPECULATION.

Q. Was that speculation in oil in 1865, or what was the time? A. I should place it at a later period than 1865. I should place it from 1870 up to the early nineties. There was very little speculation in oil after the movement known as the Producers' Protective Association. That movement killed speculation in oil.

Q. Now, how was that brought about? A. That movement?

Q. Yes. A. It was brought about by an agreement between the Standard Oil Company and the association called the Producers' Protective Association, and we have the agreement here.

Q. Then you give credit to the joint action of the Producers' Protective Association and the Standard Oil Company for the suppression of speculation? A. In removing the feature of injudicious speculation. Proper speculation is all right. It is proper and just for a person to buy oil and hold it—buy the certificates outright. No one ever raised a voice against that—against the purchase of oil outright. It is the mere gambling on margins that has been destructive to values and injurious to the business standing of the communities in which these exchanges are located.

Q. Since that agreement have the producers, the Producers' Protective Association, or the Standard Oil Company sustained in any way the petroleum exchange in New York? A. No.

Q. Have they been adverse to it? A. Well, I cannot say they have been adverse to it; I can simply say that they have left it alone.

Q. In other words, the regulation of prices by the Standard has eliminated the speculation in certificates entirely? A. Undoubtedly.

Q. At what date do you place Joseph Seep's quotations? A. January 23, 1895.

Q. Now, does it follow that Mr. Seep's quotations are standard and stable quotations following that agreement? A. They are.

Q. So we have now reached a market where speculation has nothing to do with the price of oil? A. Precisely; we have reached the point now where the consumer makes the prices.

EFFECT OF THE SHUT-IN MOVEMENT ON SPECULATION.

Q. (By Mr. Phillips.) Did not the removal of a large amount of stock by the shut-in agreement between the Standard and the producers have much to do with the elimination of speculation? A. That was an incident or a factor in it. I was about to say that, in connection with the oil exchanges, a habit grew out of the speculation that proved very injurious to all concerned. The speculator on the exchanges along in the early eighties began to influence the market by field conditions at every possible opportunity—that is, by rumors of wells, rumors of big strikes in localities from which facts could not be obtained readily. The effect of these rumors was either to elevate or depress values for the time being, and no matter if they were corrected within an hour or two, the effect would be felt on the market. Out of that movement grew a protective system among the larger speculators, and the prominent producing concerns grew out of that movement. They selected experts who were placed in the fields at points of interest where large wells were coming in or expected to come in. It was their duty to watch developments and report results at the earliest opportunity.

Q. What were they called? A. They were called scouts.

Q. (By Mr. Jenks.) Did these persons make the information public or keep it for the special use of the Producers Union? A. The Producers' Union did not do that. It was the individual producers; the individual speculators had them there for the purpose of speculation. Large producers had them there for the purpose of being informed as to the true state of affairs.

Q. (By Mr. Phillips.) Did you ever act as a scout in those days? A. I had that honor. I laid down the quill for a period of two years and served as a scout on the frontier.

Q. For whom? A. For the Union Oil Company. I reported to them daily and my reports were accepted at their value at the time.

Q. (By Mr. Jenks.) I understood you to say yesterday that when this Producers' Union was formed

one of its chief purposes was to gather trustworthy statistics and information, in order, as I suppose, to check somewhat the speculation on exchanges? A. Not this particular movement. That referred to the movement in 1865 and 1870. I should like to refer to that later on. I have some data on that subject.

Q. (By Mr. Farquhar.) Before leaving the subject will you state as nearly as you can who the parties were that participated in that movement from 1865 to 1870 and later on? Were they the large or the smaller producers? And will you also give us as complete an idea as you can of who participated in these speculations? A. That happens to be a pretty long subject, but if you will bear with what may seem to be a digression, I might start in by explaining what first made oil prices. That will lead to the oil exchanges and the dealers in oil at the stated places and times where and when they did their trading.

ORIGIN OF THE FIRST OIL MARKETS.

The first oil markets were, in my opinion, made by the dump men on Oil Creek. Now, the dump men were the first speculators in oil. A dump is a tank of any capacity from 10 barrels to 600. The dump man developed into a refiner later on, and as a refiner was known as the B. S. refiner; that is, he took B. S. oil, non-merchantable oil, and redeemed the better parts of it and placed it on the market. The dump man visited the small producer in all localities, bought his oil at so much by contract, and if there was one or two feet in the tank bottom he immediately bought it in lump sum or so much per barrel. He also bought the good oil, the merchantable oil, from small producers, who could not hold their oil long enough to get a full shipment of 50 or 100 barrels, whose wells had declined to such a point that they could not hold for a month at a time, and were obliged to sell from day to day or week to week. The dump man was their market. When the refiners sent their representatives up in the region to purchase oil—and they used to travel up and down Oil Creek like platoons of cavalry, pricing oil at various wells—the usual method of approaching the producer was to say: "Have you any oil to sell?" The answer would be "I have so much." And then the producer would say: "What price are you giving to-day?" If it was thought the producer was not posted on existing prices the trader would probably reply: "What is the dump man paying?" Receiving a reply, he might name a figure just above it, just enough to get the oil. The dump man was the first merchant to make prices in the oil field. His price was steady all the time. You could always market with the dump man. After the first few years of the business the market was spasmodic. There were days and weeks at a time, perhaps months at a time, when there were no quotations or prices from the refiners and agents. Now, in the course of time the dump man was eliminated.

OIL SOLD THROUGH REFINERS' AGENTS.

These refiners' agents during the first 10 years of the business were migratory; that is to say, they moved about through the region making individual contracts with producers and others. Their meetings would occur at night; they would meet in the evening after supper and discuss the trade. That was the origin of the first oil exchange. Later on, as the business became systematized in fewer hands, they began to adopt regular hours for business, and one of their first resolutions was to do no trading after a certain hour in the day—6 o'clock. Later on they adopted a resolution to do no trading after 4 o'clock; then they adopted banking hours for their trading, but that was when the oil exchange became a permanent factor in the trade. All the trading, say, from 1875-76 up to 1895, was done in the exchange. Trading done outside of the exchange, and known as curb trading, was considered disreputable and classed with bucket-shop operations. The rapid fluctuations in oil in 1876 did a great deal to foster the exchange element and show people that it was possible to make money rapidly by these wide fluctuations; and the sudden advance of $3 a barrel in 1876 brought the public into speculation with the producers. I can say here and now that producers who remained out of the oil exchanges and away from speculation invariably got wealthy. Those who went into the oil exchanges outnumbered those who remained out so largely that they formed themselves into a league after a while to combat those organizations that had nothing to do with speculation and shake out of them some of their earnings.

THE SUPPRESSION OF SPECULATION.

Q. (By Mr. Phillips.) Were there not some exceptions in regard to the producers? Captain Murphy, for instance, was a producer and speculator. Did he not make a success of it both ways? A. I thank you for calling my attention to that; that is one exception. I would thank you for another one.

Q. I think as a rule you are correct. I never speculated as you know. A. No, I know you never speculated; I am satisfied of that; and you were one of the strongest opponents of the wild-cat speculation that existed, an outspoken opponent. We have letters from you in our newspaper denouncing wild-cat speculation.

Q. Especially the scout and mystery business. A. That mystery business was the source of the institution of the scout.

Q. (By Mr. Farquhar.) Are we to understand, then, that after this era of speculation and the shut-down the strong men in the oil region, the Rockefellers and others, resolved to suppress all this speculation in oil and oil certificates; that the bucket shops in oil agreed to make the shut-down on a conservative basis, and bring oil up to a paying figure for producers as well as refiners, which system, as a matter of regulation, has existed until the pres-

ent day; and that the benefit of the whole oil trade that has come to the consumer has come through the great organizations of oil men? Are we to understand by your testimony that the stronger the producers and refiners have been and the more they have been united in finding a stable market, the more the consumer has gained? A. I believe that is true.

Q. That is your observation? A. Yes.

Q. And the credit of the suppression of the inordinate speculation in 1876 and later is due entirely to the producer and the refiner, as well as stable rates of transportation and stable and cheap prices to the consumer? Are we to understand that that is the gist, so to speak, of your remarks, or have you something further? A. Well, the producer is a man of energy and force, and his tendency has usually been in the direction of overproduction; he has been entirely uncontrollable. Show him an oil field and he runs off, wild and excited, and no matter what the conditions are, he will drill as soon as he can get the means, regardless of what others are doing. That is his right; he is injuring himself as much as others.

OVERPRODUCTION AND SPECULATION THE CAUSE OF SMALL PROFITS TO PRODUCERS.

Q. You say you regard overproduction as the cause of small profits to the producer? A. Overproduction and speculation.

Q. And speculation? A. Yes, and speculation. But overproduction has been something that has bothered them for more than thirty years. We noticed yesterday that in 1862 it was necessary to turn the stopcocks on the wells, and every year or two since there have been movements to curtail production, all due to the energy of the producers.

Q. (By Mr. Smith.) Has the consumption of oil gradually increased year after year? A. Yes.

Q. Has it kept pace with production? A. Yes; I should say it has substantially kept pace with production, but the price always induces consumption.

Q. (By Mr. Farquhar.) What effect has the cheap crude oil on the refined oil profits? A. Well, I cannot say whether or not the manufacturer's profits are very largely controlled by the price of crude oil. When he buys crude cheap he cannot sell refined very high, because the competition of the refiners is too active for that, and competition among the refiners controls the prices to the producers very much in the same manner. I should say that in a period of very low prices the refiners suffered equally with the producers.

Q. There is a sensitive touch between the two? A. Yes, there is a sensitiveness between the two. At a medium price they succeeded better; that is, at a price large enough to make it remunerative for the refiner and to induce consumption. There has to be a medium beyond which it is dangerous to go on either side.

Q. Testimony has been given before this commission which indicates a great deal of the dissatisfaction and grumbling on the part of the producer, testimony which goes to show that the producer is the only one that is affected injuriously in the whole business. It indicates that the refiners are making money while the producers are losing. They have to take the rates that the Standard puts as well as their own association, which follows the Standard, as we understand it. Now, as a business proposition, can the producer ever ask to divide the profit with the manufacturer? A. I should think not.

PRODUCERS HAVE NOT BEEN ABLE TO REGULATE THE PRODUCTION OF OIL.

Q. Does it not legitimately belong to the producers to so regulate their own output, trade, and business that they will conserve their interests in producing the oil and selling it to the refiner? Can they legitimately share in any profit beyond that? A. I should think not. It has been their constant aim to regulate their supply, but the business is one that is uncontrollable by reason of new producers constantly coming in with new fields. The conditions change continually now. If it were possible to form a combination, as did the men who produced oil on Oil Creek in 1870, when they formed their producers' agency, their corporation, and their limited partnership companies with a subscribed capital and the declared purpose to retire the surplus portion of the oil, a combination so close as to embrace everybody in the business, the same prices might exist to-day, and we might be paying the prices that were current in Cincinnati at the close of 1865. If it were possible to do that, the producers could in that case control their output and ask and receive anything they wanted for oil. The opening of new fields, as I remarked, brings in a class of new producers. Take, for example, the Parker's Landing field, opened entirely by what we now call tenderfeet, farmers, stock companies, persons owning a fraction of an interest. I happened to be present during the greater part of the development of that field, and I believe I am reasonably familiar with operations of that kind.

Q. (By Representative Livingston.) Do I understand you to say that the producers' organization is distinct from the refiners' organization? A. Yes.

Q. Why do not the producers refine their own oil and get rid of these refiners? A. They have attempted that in many cases.

Q. Why is it that they failed? A. Well, for that I shall have to refer you to the officers of the association.

Q. Do I understand you to say now that the producers are able, that they have capital and brains enough to produce the oil? A. They certainly have.

Q. Do I understand you to say that they cannot refine their own oil independently of that organization? A. I can answer that in this way: They never have; they have attempted it and failed.

Q. Have they not been able to combine? A.

The failure does not seem to be due to lack of combination; they have combined readily enough.

Q. (By Mr. Farquhar.) The combination has never stood? A. The combination has stood, but it seems to be a matter of experience.

Q. (By Representative Livingston.) What is the reason for that? Why is it that they are laboring at a disadvantage in the refining of the oil? Why do they not put up their own refineries and refine all they make and get all there is in it? A. They do not do it; we know that.

Q. (By Mr. Smyth.) It is usually considered as a separate business? A. It is a separate business.

HOW THE PRODUCERS ARE HANDICAPPED.

Q. (By Representative Livingston.) If one-third of the oil producers should organize, could they not control the price? I know that if one-third of the cotton raisers will organize they can control the price of every bale of cotton all over the country; I know it is also true of the wheat raisers. Now, could not one-third of the oil producers organize and thereby get rid of all this handicapping? A. They could organize up to the point of establishing manufactories; but the manufacturing talent and experience and the merchandising talent and experience might be wanting among the producers.

Q. Would the railroads stand in the way of their organization? Is that one of the impediments? A. I agree with what has been said about the early conditions in the oil business. The refiners being able to offer inducements to the railroads in the way of very large shipments, obtained some concessions which enabled them to tide over a time when they needed assistance very much.

Q. It is very important for this commission to know whether the railroads or any other combinations or corporations whose franchises have been granted by the States or the General Government stand in the way of the producers. I do not see why they do not organize. If it is the railroads or any other organizations having franchises or charters that stand in the way of a legitimate profit from their oil it ought to be known? A. I am leading up to that point in discussing the existing organization of the producers.

Q. (By Mr. Phillips.) Now, is it not a matter of sworn testimony by the present president of the Pennsylvania Railroad that the Standard Oil Company received over $10,000,000 in rebates in about fourteen months in the early days? A. I do not so understand it. I understand that certain testimony was given by the present president of the Pennsylvania Railroad, certain figures stated, and that certain deductions have been made from those figures by another person who did not testify. The deductions of this person are given as the testimony of the president.

Q. I think there is a document there—— A. (Interrupting.) I am referring to that document. My remarks apply to it. The president did not testify to the figures and he gave no sums. There is nothing stated in the testimony about any sums of money received.

Q. They paid rebates to someone of something over $10,000,000 in fifteen months? A. He did not say that; the president did not so testify.

Q. My recollection may be incorrect. It is in that volume there. A. It is in that volume in the testimony of Mr. Lewis Emery, Jr. He testified to that, and it is his own testimony.

Q. Was it not Mr. Cassatt's testimony? A. He goes further than Mr. Cassatt. Mr. Cassatt testifies as to the operations of his own road; and Mr. Emery takes it for granted that the three other roads within the pool at the time conceded the same rate, and upon this he checks the entire production for the period of 17½ months. He takes the total production for that period. During that period he was shipping to the seaboard by his pipe line and by water as much as 2,000 barrels a day, and he includes that. The trouble is that his figures cover oil that does not go over any railroad. These roads were from the producing regions to the seaboard. There were shipments westward to which this does not apply, shipments from Pittsburg, and shipments from Huntington over the Chesapeake and Ohio to Norfolk.

THE EFFECT OF OVERPRODUCTION ON PRODUCERS RESUMED.

I have said that the ills of the producers proceed largely from overproduction and from speculation. On the point of overproduction we will read the circular issued in 1870 in connection with the first organized movement for the betterment of the producing trade.

Q. (By Representative Livingston.) Now, is that on the point of overproduction? A. On overproduction; yes. (Reading.)

Office of the Secretary of the Petroleum Producers' Association of Pennsylvania,

Reno, Pa., April 25, 1870.

Dear Sir: This association is a voluntary organization "for the protection and promotion of the interests of oil producers." Its objects are declared to be "the collection and dissemination of valuable statistics and information respecting the production of petroleum, the securing of the most advantageous facilities for transportation, the protection of the producing interest against unfriendly legislation and against unjust exactions by whatever means threatened or attempted, and the general improvement of the methods of producing and handling oil.

Any person actually engaged in the production of crude petroleum may become a member of the association, with the consent of two-thirds of the managers present at a regular meeting of the board, upon subscribing the constitution and paying a membership fee of $5.

Among other things, the association is engaged in the preparation of a full report every month of the production of oil in Pennsylvania, embracing information of value, not only to the oil producers, but to all who feel an interest in the progress of the oil producing business.

This report is made up by districts from detailed

reports of farms and single wells, and its correctness is verified by the personal visitation of all the districts by a special canvasser of ability and integrity, employed for the purpose by the association. The report exhibits monthly, in a compact table, by districts and in the aggregate, the numebr of barrels of oil on hand at the wells, the amount of oil delivered from the wells, the aggregate production for the month, the average production per day, the numebr of wells producing, wells being drilled, the number of wells commenced, the number of wells completed, the number of wells abandoned, the number of abandoned wells resumed, the capacity of iron tankage, the number of barrels of oil stored in iron tankage. These statements afford a concise view of the conditions and progress of the oil producing business essential to an intelligent comprehension of it by operators and dealers in oil. It is designed to extend the scope of the report so as to embrace the local shipments by railroad and river, the stocks of oil in hands of refiners, amount of crude and refined oil in store at home and abroad, the foreign shipments, etc.

The amount of money realized from adjoining fees of members is wholly insufficient, after providing for the necessary current expenses of the association, to defray the constant expense of preparing and publishing these reports, and at the last meeting of the board of managers of the association the following resolutions were adopted:

"Resolved, That, for the purpose of securing funds to meet the expenses of the association, each member be requested to contribute, as membership dues, $5 at the beginning of each calendar year; and that the secretary be directed to furnish each member, who shall have paid the annual dues as above provided, a copy of each Monthly Report of Production in circular form.

"Resolved, That the secretary be authorized to regularly furnish at $5 per year, to all persons who may subscribe therefor, a copy in circular form of the Monthly Report of Production, and that he be authorized to furnish to all members and subscribers entitled to receive the Monthly Report, as above provided, additional copies to their own addresses, for gratuitous distribution only, at such rates as he may prescribe, not exceeding $1 per copy.

As authorized, extra copies of the report, printed upon good strong paper, of light weight, to cheapen postage, will be furnished to members of the association not in arrears for annual dues, and to regular subscribers to the report, to their own addresses, for gratuitous distribution only, upon the following terms:

One copy each one month for a year.....	$1.00
Two copies each month for a year.....	1.75
Each additional copy for the year.....	.50

All persons engaged in the production of petroleum, either personally or as members of petroleum mining companies, are urgently requested to become members of the association; and those who are not eligible to membership, but who feel an interest in the success of the association, are respectfully invited to subscribe for the report as a means of promoting the objects of the association.

It is suggested to petroleum mining companies that, while they can not as corporations become members of the association, it would be gratifying to receive from each company such a contribution to the funds of the association as would cover a membership fee for at least each of the officers of the company and members of the board of directors, together with such of its employes as they may see fit to constitute members of the association. In addition to the advantage of having each one who may be engaged in carrying on the operations of the company thoroughly posted in the statistics and facts relating to the petroleum business, the presentation of a membership in the association to an employe would be a judicious method of expressing appreciation of his services and of increasing his intelligent interest in the business.

Please make remittances by postoffice order, or by draft when convenient, addressed to F. W. Hastings, Esq., assistant secretary, at Franklin, Venango county, Pa., who will acknowledge the same as received, and forward receipts therefor signed by the secretary and treasurer of the association. Be careful to give accurately and fully the name and postoffice address of members and subscribers, that no errors may occur in acknowledging receipts and sending reports.

Please favor the association by such subscriptions as you may be able to make or secure.

Respectfully,

C. V. CULVER,

Secretary of the Petroleum Producers' Association.

Q. (By Mr. Phillips.) What date was that? A. April 25, 1870. As production proceeded the consumption did not keep pace with it. There was a constant increase in the supply above ground. It became apparent that further efforts were required for the betterment of the trade. A concern, known as the Producers' Agency, with a stated capital, was therefore organized to purchase from the producers within this association, a certain amount of oil per day or per month and retire it, or store it and keep it off the market to the disadvantage of the consumer. It will be sufficient to state briefly what they proposed and expected to do by the retiring plan.

Q. Was that ever carried into effect? A. It was carried into effect to the extent of an organization.

Q. It never had any effect on the market. The money was not subscribed, the plan was not carried out? A. The money was partially subscribed and the organization effected. I am attempting to show the efforts of the producers were constantly making for the betterment of their own condition and that was an effort to put their business on a paying basis.

Q. Was it an effective one? A. It was not.

Q. (By Representative Livingston.) Tell us why? A. The only reason I can assign is the constantly varying condition of the oil trade. With every change in the field new men were brought into the business and they were generally the most energetic and aggressive of producers. They went on regardless of the experience of others.

WHAT IS MEANT BY OVERPRODUCTION.

Q. What do you mean by the overproduction? A. I mean more than would be consumed at remunerative prices at the time.

Q. You mean more oil than the world would consume? A. More oil than the world would consume at that time; the facilities for taking care of a large surplus productionu were not in existence at that time.

Q. How much have the producers and refiners ever had that they carried over 18 months? A. Forty million.

Q. Forty million barrels? A. Forty million barrels; yes. They had 40,000,000 barrels that they carried substantially for ten years. At the end of ten years, at the point of the highest production, there still remained 31,000,000 barrels.

Q. (By Mr. Smyth.) Was that carried by one or more parties or by the trade generally? A. It was carried by the trade generally but the storage was supplied by one party.

Q. Who was that party? A. The National Transit Company.

Q. (By Mr. Clarke.) Is it not a fact that the existence of that quantity of oil in the world available for the market under existing conditions had the effect of preventing the very object they sought to accomplish A. By this organization?

Q. Yes. A. Undoubtedly.

Q. (By Representative Livingston.) During the time they carried that surplus oil was the price lessened to the consumer? A. Not materially, but gradually.

Q. Explain why it is that a surplus like that did not lessen the price to the consumers. A. Are you speaking now of the year 1870 or the time of the greatest production?

Q. At any time. A. My reply was on the assumption that your question referred to the period of 1870. There was no material reduction then, but at the point of the greatest production and quantity of stocks there was a very material reduction in price.

Q. Do you catch my question? You say the price to the consumer was not materially reduced. Why not? A. My answer assumed that your question referred to 1870.

Q. Well, at any time? A. (Interrupting.) I will change my answer in that event, and say it was greatly reduced.

Q. At any time? A. Yes, at some time it was greatly reduced.

Q. (By Mr. Smyth.) Owing to this large surplus? A. Owing to this large surplus. I did not mean to give an evasive answer. I will state that, at the period of the large surplus, the price to the consumer was gradually lessened.

Q. (By Representative Livingston.) Is that the time of the forty millions? A. That was at the time of the forty millions.

THE PRICE OF REFINED OIL HAS BEEN CONSTANTLY REDUCED.

Q. What was the reduction A. To the producer?

Q. No, to the consumer. A. To the consumer from the prices we have noticed at Cincinnati in 1865——

Q. (Interrupting.) No, no, I do not want any dates. I want to know what the reduction was when you had the big surplus of oil? A. Well, it was reduced to 8 or 10 cents a gallon. I can tell you precisely in a moment.

Q. Take it for granted that it was 10 cents, did you regain that loss? A. It does not appear that there was a loss. I believe that oil was sold at a profit at the time.

Q. Was the price raised to the consumer later on when the surplus disappeared? A. I think not.

Q. It remained there? A. It remained there; kept decreasing.

Q. It is a fact that the price of refined oil has been steadily decreasing for the last 15 or 20 years? A. Constantly.

MOVEMENT IN THE PRICE OF STOCK COMPARED WITH MOVEMENTS IN THE PRICE OF OIL.

Q. Did the stock in the companies also gradually decline? A. The stock of oil?

Q. No; I mean the stock in these corporations. Did the value of the Standard's stock decrease with the decrease in the price of oil? A. I think not.

Q. (By Mr. Smyth.) I suppose the cost of handling oil has decreased very much? A. Yes; very much; great improvements have been made.

Q. (By Representative Livingston.) Now, if the price of oil has decreased to the consumer on account of the surplus, and the price of the stock has not, will you explain why? A. Well, I will answer that in this way: If there were any particular company, it might be said that it was due to the larger volume handled and manufactured, the reduced rate of profit being made up on a very large quantity. But let me say the profits are not all with the Standard Oil Company. The producers in the meantime have made enormous profits.

Q. I understand that, although the price of oil decreased and you were carrying a large surplus, the value of the stock of the Standard Oil Company increased? A. The cost of producing and refining oil decreased very materially in the following years.

Q. It seems as though that did not depend upon the cost of production or anything else. It seems to be continually going up; do you know what it is worth now? A. I have not heard any quotations of the value of the stock; I am not prepared to express an opinion upon that.

THE OBJECT OF THE PETROLEUM PRODUCERS' AGENCY.

Q. (By Mr. Farquhar.) It is a good deal like the Chemical Bank of New York? A. Now, the purpose of the agency formed by the Petroleum Producers'

Association, which was created in 1869 and 1870, is contained in a few words in what is called the practical exhibit. (Reading:)

"The establishment of the Petroleum Producers' Agency is expected to accomplish among others these important things:

"It will prevent unwise competition between producers and sellers, by taking advantage of which buyers contrive to depress prices.

"2. It will, as a result, secure a fair price for whatever amount of oil the world requires—unaffected by the fact that there is more produced than the consumption demands.

"3. The sprulus oil being kept in the control of the agency, it can not be used by anyone to manipulate or depress the market prices.

"4. The surplus oil placed in tank exactly represents the overproduction and unerringly indicates its extent and increase."

Q. (By Representative Livingston.) I understand from that that you will make more money by holding oil than you can by putting it on the market? A. That is it, precisely; that is the whole subject in a nutshell. (Continues reading:)

"5. No concealment or misrepresentation can be made of the stock, or overproduction to unduly affect prices.

"6. Every producer being the holder of a tank receipt representing his share of the surplus oil is doubly interested in restraining overproduction—because he suffers both from the inability to realize upon his receipt for oil in tank and from having to deduct from the value of his production the value of that required to be placed in tank and the cost of taking it.

"7. The effect of competition and of the lack of it in buying and selling crude oil is shown by the fact that with an established demand for 16,000 barrels of oil a day and a production of the same amount, the advantages of the buyers and sellers are so nearly balanced that $5 a barrel will be freely paid by the buyer and accepted by the seller—yielding $80,000 a day for the gross production; but if the production should fall off, say, 1,000 barrels a day, competition between buyers would exist to such an extent that $6 would be just as readily paid and be readily accepted, making $90,000 for the whole. If the production should still further decrease so as to not exceed 14,000 barrels a day, the price would promptly advance to over $7, and realize at least $100,000 for the total."

Q. Make a little explanation right there. Would that be independent of the surplus carried? Would the price vary notwithstanding the surplus? A. The surplus would be retired and kept out of the way when the market advanced.

Q. Your answer is yes? A. Yes. (Continues reading:)

"If, however, the advantage were to turn the other way, as would soon be the case with such stimulating prices, and the production should reach, say, 17,000 barrels, exceeding the demand by 1,000 barrels, the competition would be between the sellers instead of the buyers, and the price would decline to $4 a barrel, making $68,000 for the daily production; with less readiness 18,000 barrels would bring at most $3.50 per barrel, or $63,000 in the aggregate, while 19,000 barrels would hardly find purchasers at $3 a barrel, or $57,000 for the daily product, and a production of 20,000 barrels would not command $2.50 per barrel, or less than half the amount that a production of 14,000 barrels would readily command, and apparent permanent production in excess of 20,000 barrels would so thoroughly demoralize the market as to make petroleum without a reliable quotation."

Twenty thousand barrels there was considered a very extravagant estimate of the production. If it ever reached that the business would not only be a losing one, but there would be no market whatever. (Continues reading:)

"The logic of this undeniably correct statement has a thousand times suggested that it would be a profitable speculation to buy the entire production at the price which is current when the production is largely in excess of demand, and, reserving only so much as the market would actually require, to set fire to the remainder, put it out of existence, and thereby realize twice as much from the remainder as the whole cost."

Q. That would be justifiable, would it? A. That is what they say here. (Continues reading:)

"Wanton as the destruction of such valuable material would be, but one consideration has prevented long ago as a speculation—that is, the great advance in price would naturally result from its consummation would so stimulate production as to entail upon the enterprising speculator the possibility of loss by a second stock larger than the first.

"There is, however, a common-sense method of accomplishing a better result by better means. The oil is too valuable to destroy or waste; and to withdraw the supply from competition with the amount which the world requires would enable the producer to realize a fair price for what is sold and retain the surplus without other cost than that of putting it in tank. But who shall do this? If any individual or firm or company were to undertake it they would find their resources, however large, eventually exhausted, only to make a market for an enlarged production stimulated by their enterprise.

"There is but one way to secure a community of interest among producers: By affording them the advantages of the good prices resulting from selling through our agency without competition, and compelling them to bear uniformly the burdens and losses resulting from excessive overproduction. These ends are sought to be accomplished through the agency, which undertakes to receive all the oil produced, to pay a fair price for what the world will consume, and to tank the surplus at the cost of the producer, for his benefit.

"The following table shows the practical result of selling 16,000 barrels of crude oil a day at $5 a barrel and storing the excess at the expense of the producer, estimating the cost of tankage at $1 a barrel.

"Observe, that if the supply is not in excess of the demand, the full market price will be paid for the entire production as fast as delivered, so that there would be no delay in making payment, and no tanking of surplus oil.

"The table is only to show what would be the result

to the producer, the demand being for 16,000 barrels a day, and the production steadily rising from 17,000 to 24,000 barrels a day.

"The operation of the plan is to secure the producer a minimum price of $5 a barrel for all the oil which can be sold—deducting therefrom only the commissions for selling the oil and the cost of tanking the surplus. For his interest in the surplus oil in store and in the tankage he has a receipt estimated in the table at a valuation of $3 a barrel, at which valuation it is assumed the receipt can be readily sold, if the producer proposes to realize upon his entire production rather than wait for the surplus oil to be marketed at a higher rate.

"The table shows at a glance what the producer will realize from the advance made by the agency, what the proceeds of the sale of the oil in addition to the advance, and what his interest in the stored oil is worth at the estimated value. The right-hand column shows what he may realize per barrel at once on his entire production by selling his interest in the tanked oil with the amount marketed.

"The advantage to producers—resulting from the establishment of the agency, by which the rates indicated can be realized from sales through it—contrasted with the sales made in competition between sellers, is so marked and decided that it needs only the simple exhibit to prove that by the operations of the agency, at least from $1 to $2 a barrel upon the entire production may be saved to the producers at large—amounting in the aggregate to from $6,000,000 to $12,000,000 a year."

contemplated it would have undoubtedly gone into effect.

Q. It was entirely ineffective and inoperative and was not received generally by the producers? A. It was inoperative. Here is substantially the same plan, adopted a few years later by the Petroleum Producers' Association. This one was effective. Agencies were established at various points in the oil regions for the purchase of oil. Oil was bought from the producers and sold substantially on the same plan for the purpose of retiring it, as may be seen by the report of the committee on organization of the Petroleum Producers' Association, Limited, adopted by the general council of the Petroleum Producers' Union, of which Mr. B. B. Campbell was president. That was a partnership affair.

Q. Did that have any material effect on the prices either to the producers or consumers? A. I cannot say that it did. But it was an effort for the improvement of trade conditions at that time. An address by the general council of the Petroleum Producers' Union of the same date states the reasons for the existing depression and urges producers to join the union. To this movement a million dollars was subscribed.

Q. Was it ever paid in? A. Well, we have only reports of the subscription, acknowledgments of the same, and the fact that it was put into practical operation. Agencies were established at various points in the oil country and they set up opposition buyers.

Q. Did it have any especial effect on the trade?

Daily product	Daily payments $5 per barrel		Daily receipts (sales 16,000 barrels) at $5	Surplus oil put in tank	Cost of tanking, $1 per barrel	Daily cash balance	Cash paid per barrel on certificates	Total cash paid per barrel	Amount per barrel of tank receipts issued	Value per barrel of tank receipts, estimating surplus oil with tankage, at $2 per barrel	Net return to producers, estimating tank receipts at 50 cents on the $1
	Cash, $3	Certificates, $2									
Barrels.											
17,000	$51,000	$34,000	$80,000	1,000	$1,000	$28,000	$1 65	$4 65	$0 35	$0 17½	$4 82½
18,000	54,000	36,000	80,000	2,000	2,000	24,000	1 33	4 33	67	33½	4 66½
19,000	57,000	38,000	80,000	3,000	3,000	20,000	1 05	4 05	95	47½	4 52½
20,000	60,000	40,000	80,000	4,000	4,000	16,000	80	3 80	1 20	60	4 40
21,000	63,000	42,000	80,000	5,000	5,000	12,000	58	3 58	1 42	71	4 29
22,000	66,000	44,000	80,000	6,000	6,000	8,000	37	3 37	1 63	81½	4 18½
23,000	69,000	46,000	80,000	7,000	7,000	4,000	18	3 18	1 82	91	4 09
24,000	72,000	48,000	80,000	8,000	8,000	0	00	3 00	2 00	1 00	4 00

Q. (By Mr. Phillips.) Now, was not that a wild, visionary scheme? It did not cause a ripple in the oil fields at the time it was presented, and there were very large producers that never heard of it. A. I am not prepared to agree with you in that statement. It seems to me there was a very considerable discussion of it in the newspapers, It was talked over at various points in the region. A fund was subscribed for it at that time. While inoperative it was owing to other causes. It failed to go into operation because of the enormous production at that time in Butler county. Had conditions remained as they were when it was A. No noticeable effect. It was very shortly abandoned, but it was an outgrowth of the movement inaugurated by D. Armstrong in 1877, 1878 and 1879. Benjamin Campbell succeeded to the chairmanship.

RESTRICTIONS ON DRILLING OPERATIONS.

I have here a drilling contract to which reference was made yesterday that I should like to submit. It is in connection with a movement in 1887 and

1888 for the restriction of operations in interior drilling:

EXHIBIT IV.—BOUNDARY LINE DRILLING CONTRACTS.

Whereas, excessive waste has occurred in the past from the prevalent practice of fighting lines, which largely increased expenses without adding permanently to the production, while it caused a spasmodic and temporarily excessive production, with a vicious influence on the market price of petroleum:

Now, therefore, to correct this waste and relieve the industry from the evils in the future, we, the undersigned producers of petroleum, do hereby agree to and with each other, as follows:

First—That hereafter the number and location of wells for the production of petroleum along or adjacent to the exterior boundary line of any producer on either side of said line shall be determined by the agreement of the producers interested in the production along said boundary line, or, in case of their failure to agree, by three abritrators, one to be chosen by the producer or producers on one side of the said boundary line; one to be chosen by the producer or producers on the other side of the said boundary line, and the third arbitrator to be chosen by the two so chosen by the producers aforesaid.

But no decision of such arbitration shall be permitted to deny altogether the right of a producer to drill when he cannot drill at all without drilling within 800 feet of the boundary.

Second—No well shall be drilled on or within 800 feet of any boundary line until its location shall have been fixed by agreement of adjoining producers or by award of arbitrators as hereinbefore provided.

Third—This agreement shall apply to boundary lines between subscribers to this contract, and not then at points where one not a subscriber adjoins and drills within 800 feet of the subscribers hereto.

Fourth—Any subscriber hereto who shall violate this agreement shall pay to the producer or producers owning or operating the territory adjoining his boundary line, who are subscribers hereto, for every well put down along said boundary line contrary to this agreement, such damages as may be awarded by three arbitrators, or a majority of them, to be chosen in the same manner as herein provided for, the fixing of the number and location of wells along boundary lines when producers do not agree. Such award shall be final and conclusive, and for the amount so awarded, respectively, shall have the right to sue and recover against offender or offenders, as if this contract were between such parties only to this contract for this purpose, shall be considered and construed a several contract, of every subscriber to and with every other subscriber hereto.

Fifth—In case of a failure to agree as to the number and location of wells along a boundary line, if any producers, or producers' subscribers hereto shall neglect or refuse to choose an arbitrator, as provided in the first clause of this contract, in that case the executive board of the local assembly of the proper district of the Producers' Protective Association shall, and they are hereby authorized to, appoint a suitable person to act as such arbitrator. And every producer shall, within three days after request made by another producer, either agree or appoint his arbitrator as aforesaid, or he shall be considered in default, and the arbitrator shall then forthwith be appointed by the executive board as above provided.

Sixth—Every subscriber hereto further agrees that should he convey any or all territory at any time to other parties, he will make such conveyance subject to all the conditions of this contract.

Seventh—This contract is to take effect on and after September 8, 1888.

INTERIOR DRILLING CONTRACT.

Whereas abundant territory as well as our own experience teaches us that the price of any commodity is mainly dependent upon the relation between supply and demand, and that petroleum is no exception to the rule;

And, whereas, the excess of visible supply of stocks of petroleum, furnishing an apparent supply largely in advance of the immediate demand, has been and still is the most depressing circumstance which affects the petroleum industry;

And, whereas, the effect of our "shut in" of production for eight months, while not as advantageous as we had hoped, has nevertheless put the price on a higher plane than that upon which it had previously rested, and, as we believe, has prevented the commodity from sinking to even lower prices than we had experience of in recent years, and we had, therefore, to limit the production by a moderate restraint of drilling, as demanded by the interests of the producers of petroleum until the stocks are reduced to an amount consistent with the healthy relation between supply and demand, and, as a result, the receipt of remunerative prices to the producers;

Now, therefore, we, the undersigned, producers of petroleum, do hereby agree to and with each other that we will not drill any wells for the production of petroleum on any farm or tract of land owned by us, except along or adjacent to exterior boundary lines of our respective properties, to a greater extent, exclusive of boundary-line wells, than one producing well for each 20 acres and each fractional part of 20 acres; provided that additional wells may be drilled with the consent of the local assembly of the Producers' Protective Association for the district in which the particular property may be situated and of the general executive board of said producers' association, or, in case such consent cannot be obtained, upon the allowance of the arbitrators, or a majority of them, one to be chosen by the person or persons desiring to drill, one to be chosen by the local assembly of the Producers' Protective Association for the district in which such property is situated, and the third by the two so chosen.

And we further respectively agree that all conveyances made by any of us of oil territory during the continuance of this contract shall be made expressly subject to all the conditions of this agreement.

This agreement shall continue in force until the 1st day of May, 1889, but may be abrogated before that date by the votes of a majority of the general assembly of the Producers' Protective Association, and such general assembly shall be convened to consider the question of abrogation upon the demand of one-third of the local assemblies of said association.

ATTEMPTS TO IMPROVE THE CONDITION OF THE BUSINESS IN 1887 AND 1888.

We have the various movements known as shut-in or shut-down movements for the betterment of the oil producers from 1870 up to 1887 and 1888, omitting that of 1884, which was only partially successful. I will read a few notes I have made on the subject for the purpose of connecting this association with subsequent enterprises in which the producers' association started new pipe lines and refineries, the Pure Oil Company embracing the whole movement. (Reading):

The shut-down movement of 1887 and 1888, in which the Standard Oil Company co-operated with the producers and did much to make the movement a success, was no doubt the most successful action ever inaugurated by the producers.

Having its inception among some of the heavy operators in the Washington county field, it extended over the whole region and embraced all but a very few of the operators. Its scope was wider and its effect greater than any similar movement. The mutuality of interest among all branches of the trade rendered its success certain. Thus we find that the producing ,refining, land, and working interest all co-operated to make the movement a success and enhance the value of the product of the producer. The Taylorstown operators, controlling 6,372½ acres of producing territory, early in June entered into an agreement to restrict production. At this period the reduction of stocks was going on quite rapidly, but the market was in the sixties, with the consumption 8,000 barrels a day over the production; hence the conditions were favorable for the inception of the movement. On August 2, at Bradford, there was a meeting of representative producers at the invitation of H. L. Taylor, of Buffalo, at which time it was developed that the organization pending was so nearly completed as to insure a successful undertaking of the work mapped out, and the meeting decided to postpone action for a short time. About the same time the P. P. A. held a few secret meetings in Bradford in the interest of the shut-down. The movement became the subject of much discussion in the newspapers, and its probable outcome was very thoroughly discussed.

The sensational press got in its work on this movement early in the game, and among other things given publicity by the Cleveland Leader in connection with the shut-down movement was a series of propositions which implied that the sole object of the movement was a battle against the Standard Oil Company, which allegations were promptly denied by Mr. Kirk. The Derrick criticised the action of one man in Butler county who was alleged to be hustling to get down all the holes he could while the preliminaries of the shut-down were being arranged. In Butler county, in the Reibold pool, he had two wells doing 2,900 barrels a day. The Derrick made a couple of attempts to interview him on the subject of the shut-down, but he maintained a strict silence upon the subject. Early in September there were meetings of the P. P. A. at Bradford, and a conference of large producers at Pittsburg, which included D. O'Day, of the National Transit Company. The operations in Butler county attracted special attention, and a special to the Derrick from Butler asserted that the operator was a shut-down man in name only. The leading producers, about the middle of September, had another conference at Pittsburg with officials of the Standard, presumably on matters connected with the shut-down movement. It was learned from Washington county that McKeown and Willets, two of the largest operators in the field, had refused to have anything to do with the movement, contending against the shut-down movement as a means of bettering the conditions of the trade, which had been depressed from overproduction for 10 years. Some persons asserted that the shut-down movement would have had the effect of bringing in new producers, with the result of defeating the very object of the project. The discussion in the Derrick of the shut-down movement covered a wide scope, and many diversified opinions as to how to better conditions were expressed, but the general trend of opinion was largely in favor of the shut-down. The production from the three wells in the Riebold pool amounted to 5,000 barrels daily, and on September 29 a meeting of the P. P. A. was held at Emlenton, at which matters pertaining to the shut-down were considered but not made public. At this same meeting and among the Emlenton producers it is said there was a decided change of sentiment toward the Standard Oil Company, it being asserted that but for the Standard the Pennsylvania oil would be selling at 50 cents per barrel. On October 2 the four wells at Riebold were making 5,400 barrels a day, which might be called a pretty strong showing for a man working for the success of a shut-down movement. There is no intention of stating that his actions were contrary to contract; everything was open and understood.

At the middle of October, N. F. Clark, one of the leaders in the shut-down movement, stated that 80 per cent of the producers had joined the P. P. A. and were ready to get into the shut-down; he also found that more than two-thirds of the oil was produced by the small producers. During the month of October the executive committee of the P. P. A. made strong efforts to get all the producers of oil into line, but still the gushers continued to arrive on

schedule time at Riebold, and on October 20 another was added to the list, making an aggregate production of 5,520 barrels from six wells. The first authentic news that the shut-down would be a success came out October 23, when it was learned that the movement would go into effect on November 1, and that its essential features were as follows: The shut-down was to include the shutting in of not less than one-third of the production of the operators in the agreement, the cessation of drilling operations, and the general co-operation of the producing element. The Standard Oil Company entered into the agreement to help make it successful. The company set aside 6,000,000 barrels of oil. The profits upon 5,000,000 barrels of this, that is, the advance above 62 cents, they proposed to donate to the producers, while the profits on the other 1,000,000 were to accrue to the oil-well workers thrown out of work by the shut-in and shut-down. This result was arrived at only after prolonged and energetic negotiation on the part of the producers, but once all the elements of the business were combined it was practically assured that the movement would be successful. This looked like a one-sided proposition wherein the Standard was not likely to be much of a winner, but, that being the agreement brought home by the producers' committee, they returned to the region with the sole idea of organizing the producers and making a success of the movement. How well they succeeded in handling the question is best evidenced by the fact that there were then 14,000 producers, and that they succeeded in enlisting 85 per cent of the number into the movement.

BUSINESS ASSOCIATIONS ORGANIZED BY THE PRODUCERS' PROTECTIVE ASSOCIATION.

That continued in effect until October of the year following, both sides to the agreement faithfully carrying out every condition. The Producers' Protective Association continued their organization, which at the start was secret. I think the restriction extended so far as not to permit the naming of any officer of the concern; anyone holding an office in the association was not allowed to be known by name outside of the organization itself. Altogether it was one of the closest corporations ever organized for business purposes. They continued to hold their meetings and discuss the conditions of the trade, which were not permanently bettered by this shut-in movement, owing to very large developments at McDonald within two years of the termination of the shut-down agreement, where an enormous production took place in a very short time. While operations were progressing in McDonald, the Producers' Protective Association proposed to organize business associations fostered by their own association. They were instrumental in organizing at least three or four, of which the first was the Producers' Oil Company, Limited, which had a capital of $600,000. This went into business in Allegheny county, in the vicinity of the McDonald field, but on the edges of the field, and did not participate to any great extent in relieving the producers of the overproduction existing there. After a period in which no very considerable success was achieved, another company was organized, known as the Producers and Refiners' Company, in which certain refiners, co-operating or combining with the associated producers of the Producers' Oil Company, subscribed $250,000 additional capital, which was invested in pipe lines furnishing an outlet from the McDonald field, or the terminus of the Producers' Oil Company, Limited, to the refineries at various points in Pennsylvania. The next step in the movement was to combine these companies by a sale of one to the other. The Producers' Oil Company, capitalized at $600,000, was absorbed by the Producers and Refiners' Oil Company, capitalized at $250,000; in effect, the weak company took and assumed the property of the greater concern. From this time the Producers' Oil Company practically went out of existence, though I think the organization was maintained and all the property of the Producers' Oil Company, Limited, was not disposed of at that time; some of it remained, and perhaps still remains. This proving unsatisfactory, another consolidation was made about 1894, by which the Producers and Refiners' Oil Company undertook to absorb the United States Pipe Line Company, a company organized with a capital of $1,000,000, with two systems of pipe lines, and according to the terms of the purchase, the stockholders of the United States Pipe Line Company—the only straight and real corporation connected with the whole concern, because it is incorporated under the pipe-line act of Pennsylvania, and none of the others are—

Q. (By Mr. Phillips, interrupting.) The others were limited partnerships? A. The others were limited partnerships.

Q. Are you not mistaken about the two first companies undertaking to absorb the United States Pipe Line Company? The United States Pipe Line Company was formed before the Producers and Refiners' Company, and they only worked in harmony with the United States Pipe Line Company at this time. Is not that correct? A. I am giving this largely from memory, and I may be in error. I have a paper here describing the whole process, and it may be just the other way. It may be that the United States Pipe Line was absorbing the other concerns, but there was an absorption attempted.

Q. Are you quite certain there was at that time? Were they not simply making running rates and agreements? A. I will proceed and then afterwards read the answer of J. J. Carter in a suit in equity. Here is a paper which recites the whole transaction.

Q. (By Mr. Kennedy.) An official paper? A. I do not believe it has a seal; it is a copy of the official paper.

Q. (By Representative Livingston.) A certified copy? A. No.

Q. (By Mr. Farquhar.) Is there a statement to

show where the original papers can be found? A. Oh, yes; the original papers can be found.

THE ORGANIZATION OF THE PURE OIL COMPANY.

Q. Is there any verification of the correctness of this copy? A. No; there is no vertification of this copy, which is merely a copy of the petition to dissolve an injunction. Whatever the attempt was—to consolidate, or combine, or absorb one of these pipe lines or the other at the time—it failed through the activity of one of their own stockholders, who went into court and prevented this consolidation. That being the case, another company was formed, known as the Pure Oil Company. The Pure Oil Company was formed on or about the 24th of January, 1895, at a meeting of producers at Butler. Subscriptions were received to the amount of $50,000 toward the organization of what was called the Pure Oil Company. The stated purpose of this company was to market the products of the refineries and pipe lines. It was to be the commercial organization of the trust then in process of formation, and it has since been sought by a reorganization of that concern which took place about 1897 in New Jersey—

THE PURE OIL COMPANY CALLED A TRUST.

Q. (By Mr. Phillips, interrupting.) Why do you call the Pure Oil Company a trust? Was not that a straight corporation like the Standard and others that have since organized? A. I quote here from Mr. David Kirk, the first president. He calls it a trust, and it is so called here. It is cited as a trust agreement.

Q. It was organized under the laws of New Jersey as a corporation? A. Mr. Kirk calls it a trust.

Q. Does Mr. Kirk's calling it a trust make it a trust? A. I think the organization makes itself a trust by the appointment of trustees for the conduct of the business.

Q. It is only a voting trust, and have not voting trusts existed in all ages, in Europe as well as America? A. I am not contending against the legality of the trust; it is merely a statement of fact based on information obtained from David Kirk. The reorganization took place at Taylor's Hotel in Jersey City in 1897, and the powers of the organization increased from that moment. They have attempted to take in all the corporations combined with them, to combine into one concern. The attempt was made several times, as I understand it, to absorb all the old interests in which the Producers' Protective Association is concerned, and they are still attempting it with a very considerable show of success, as I am informed.

(The witness then read Exhibit B, filed with a bill in equity in a suit entered by Mr. David Kirk, at Pittsburg, Pa.)

Q. (By Mr. Phillips.) Did the McCalmont Oil Company have anything to do with this as a company? A. Possibly David Kirk may have acted as trustee for the McCalmont Company; as president of the McCalmont Oil Company he may have been trustee for that company in some subscriptions of this stock; that is the only explanation possible at this time.

Q. The agreement itself, then, shows that the trust to which you refer is a voting trust for the election of directors, does it not? A. It has a tendency to show that. I believe, if you will indulge me the time, we will accomplish more—

Q. (By Representative Livingston.) What is the point you wish to bring out? A. I will get down to that by reading one clause and submitting the rest for your consideration. The clause I particularly wish to call your attention to is one that provides for the dissolution of the trust and the conditions under which it may be done:

"Fourth—This agreement may be cancelled, and the trust hereby created dissolved, duly executed, of the equitable owners of four-fifths of the shares held in trust hereunder, and of four-fifths of all the other shares of the company, after providing in full for the redemption or purchase at one hundred and ten dollars per share, in cash, of all the preferred and common shares of the company at the time outstanding."

The purpose of this clause is in effect to make the trust perpetual; but if dissolved, the shares under that agreement, costing originally $5, are compelled to be sold at $110. They agree in this to repurchase at $110 when the shares previously cost $5.

Q. (By Mr. Phillips.) I think perhaps that is a mistake. A. It is here. It is part of Mr. Kirk's Exhibit B.

Q. (By Mr. Livingston.) Do you mean to say that A and B, two members of the company turn in $110 for their own stock or outstanding stock? A. It stakes outstanding; it puts the redemption of all stock at $110, the original cost of the stock being $5.

Q. (By Mr. Phillips.) Does not that mean 10 per cent? A. I am only reading what it states.

Q. Is that a certified copy? A. Oh, no; it is a copy of the record in Allegheny county, in a suit entered by Mr. Kirk, the retiring president.

PRESENT STATUS OF THE PURE OIL COMPANY.

Q. (By Representative Livingston.) What is the condition of that company now? A. It is in existence and largely in control of this three-million corporation. There is an authorized capital of ten millions, with possibly $400,000 paid in. It then substantially controls the other combinations, in which upwards of three millions are invested.

Q. (By Mr. Kennedy.) What is the voting power of the five trustees? A. I have stated that it is the power to vote all the stock represented in the trust.

Q. Not for the transaction of other business? A. For the election of directors. It is stated in the second clause: "At all meetings of the company for the election of directors or for any other purpose, to cast the entire number of votes which, as holders of said shares, they would be entitled to cast."

Q. That is a true copy of the original? A. It is a true copy, and the original may be obtained in the court at Pittsburg.

Q. (By Mr. Smyth.) Your opinion is that the company controls all these companies? A. Substantially; it has come to be known as the Pure Oil movement.

Q. (By Mr. Phillips.) Were there not more than five trustees? A. It is necessary to say that there have been some changes in the organization since then. At a meeting not long ago in New Jersey, I am informed, an attempt was made to reconstruct the by-laws, and in this they may have changed the voting power. This represents the condition of affairs in 1897. I submit the whole:

EXHIBIT V.—TRUST AGREEMENT, AND BY-LAWS AND RULES AND REGULATIONS OF THE PURE OIL TRUST.

Exhibit B.—The Trust Agreement in Full.

This agreement, made and entered into by the Pure Oil Company, a corporation organized and existing under the laws of the State of New Jersey; David Kirk, Jerome B. Akin, Marcus L. Lockwood, Walter A. Dennison, Charles H. Duncan, Theodore B. Westgate, William L. Curtis, James W. Lee, and David Kirk, trustees for the McCalmont Oil Company, severally subscribers to and owners of the capital stock of the said Pure Oil Company, and Thomas W. Phillips, Lewis Emery, Jr., Rufus Scott, Clarence Walker, Louis Walz, James W. Lee, David Kirk, Marcus L. Lockwood, Jerome B. Akin, Charles H. Duncan, Hugh King, Michael Murphy, Adolphus A. Hoch, Ferdinand Reiber, and Walter A. Dennison, parties mutually agreed upon to exercise the trusts created hereunder:

Witnesseth, That whereas the Pure Oil Company is formed for the purpose of engaging in directly and of aiding other companies and parties engaged in the production, transportation, storage, manufacture and sale of crude petroleum and its products, and in any business incident thereto, and it is desired to enlist therein the co-operation of other parties, and to procure capital to be invested in the shares of its capital stock, and in such other ways as may be desirable, which investments are to be solicited from parties not now interested in the company; and

Whereas it is advisable, equitable, essential and intended for their safety and advantage of all interests that the control of the said Pure Oil Company shall be secured permanently, as to prevent and render impossible at all times the diversion of its resources and business from their intended use and courses, in opposition to monopoly in the business, and to permanently protect and maintain what are known as the "independent interests" in the petroleum industry, and to maintain the policy agreed on for conducting the business of the company in the interest and for the protection of all rights in the company, created by mutual agreement of shareholders, or by operation of law; therefore the said parties hereto, in consideration of the sum of one dollar by each to the other paid, the receipt of which is hereby acknowledged by each, and in further consideration of the mutual benefits received ,to be received, or expected from the agreements, covenants and trusts hereinunder contained, and from the undertakings and business to be promoted, do hereby agree and consent to the various acts and things hereinafter set forth; provided, however, that no party hereto shall be bound to do any act or thing, or be responsible for the results or consequences of any act or thing done or omitted to be done, except so far as relates to such act or thing as he himself expressly undertakes to do and perform; and do further agree as follows:

First—The capital stock of the Pure Oil Company, as authorized in its certificate of organization, is to be one million ($1,000,000) dollars, represented by two hundred thousand (200,000) shares, of the legal par value of five ($5) dollars each, divided into classes and to be issued, held and transferred subject and according to law and the by-laws, rules and regulations adopted and approved by all the shareholders of the company, a copy of which is hereto attached and referred to.

Second—The said David Kirk, Jerome B. Akin, Marcus L. Lockwood, Walter A. Dennison, Charles H. Duncan, Theodore B. Westgate, William L. Curtis, James W. Lee, and David Kirk, trustee of the McCalmont Oil Company, are the owners of all the shares of the capital stock now subscribed, amounting to three thousand (3,000) shares, of which they hereby transfer to the said Thomas W. Phillips, Lewis Emery, Jr., Rufus Scott, Clarence Walker, Louis Walz, James W. Lee, David Kirk, Marcus L. Lockwood, Jerome B. Akin, Charles H. Duncan, Hugh King, Michael Murphy, Adolphus A. Hoch, Ferdinand Reiber and Walter A. Dennison sixteen hundred (1,600) shares, being more than a majority of the shares of the company now subscribed, and agree that one-half of all the shares hereafter subscribed and issued shall be transferred in like manner to the said parties and their associate trustees, as may be appointed, to be by them held in trust for the uses and purposes herein proposed, and subject to the terms and conditions as follows:

First—The equitable ownership of the trust shares and all interests herein shall be subject to the terms of this trust agreement; such ownership of the shares or interests therein may be sold at the will of the holder, but no sale, transfer, or conveyance of such ownership or interests shall give to the purchaser any rights other than are provided for in the by-laws, rules and regulations of the company and in accordance with this trust: the trustees hereunder shall at all times be recognized as the legal owners and holders of the trust shares to carry into effect the purposes of this trust, and all equitable owners of trust shares or interests therein shall specifically agree in writing to the terms of this trust, and no transfer of any such shares or interests shall be made, or be effective if made, until the transfer of such equitable ownership or interest

shall have agreed in writing to receive and hold the same subject to the provisions of this trust.

Second—At all meetings of the company for the election of directors, or for any other purpose, to cast the entire number of votes which, as holders of said shares, they would be entitled to cast.

Third—Each trustee at such meetings shall be entitled to cast an equal number of all the votes which all of the trustees would be entitled to cast in the aggregate, if present, except as hereinafter provided.

Fourth—In case of differences of opinion among the trustees present at any such meetings as to how such votes shall be cast in regard to any matter or thing to be voted on, they shall be cast as the representatives of four-fifths of all the shares held under this trust may direct in writing, if so demanded in writing by any of the trustees.

Fifth—Any trustee unable to attend to any meeting of shareholders, and to personally cast the votes he would be entitled to cast if present, may authorize any other trustee to cast the vote which he would be entitled to cast personally present, which authority shall be in writing, approved by three-fifths of the trustees other than himself.

Sixth—When none of the trustees can be present at any meeting of the stockholders, legally held, they may be represented in proxy by an attorney appointed in writing, executed by three-fifths of the trustees.

Seventh—The trustees may execute such consents in writing as in their opinion it may be right and proper for them to do in the interest of the Pure Oil Company and of the owners of the shares held by them in trust, provided that no such consents shall be executed against the objection of the equitable owner of 10 per cent of the shares held by them in trust, unless after the question of executing such consent shall have been submitted in person, or by writing, properly addressed to the several equitable owners of the shares held in trust, and approved in writing by such owners of three-fifths of such shares.

Eighth—The number of trustees may be increased or diminished at any time; or any trustee may be removed, without assignment of cause or reason therefor, by three-fifths of the trustees and the written consent of the equitable owners of three-fifths of the shares held in trust hereunder; and upon such removal, or on filing of such written consent with the secretary of the company and on notice in writing delivered to the party so removed, or sent by registered letter to his proper address, the rights, duties and obligations of such party, as trustee, shall immediately cease.

Ninth—In case of death, resignation or removal of any of the trustees the trust shall be exercised by the remaining trustees until the vacancy be filled by the appointment of new trustees for that purpose, on the nomination of the equitable owners of a majority of the shares previously represented by the trustees, whose place is vacated with the consent, in writing, of the equitable owners of three-fifths of the shares held under this trust and the approval of the three-fifths of the trustees.

Tenth—No trustee has any such beneficial interest in this trust, personally, as to entitle him to maintain any action at law or in equity to enjoin, delay, hinder, or prevent his removal from the trusteeship, or to recover any damages on account thereof from the company or the trustees, or from the individual stockholders by whose action he may have been removed.

Eleventh—The trustees shall appoint a chairman and secretary, and shall keep regular accounts showing the ownership and residence of the various equitable owners of the shares held by them in trust, and shall execute and deliver to such several owners certificates in due form, approved by the directors of the company, evidencing the number of shares held by them in trust for each of such several owners, and shall make such transfers of any of the shares as they may be requested to do by such several owners on the surrender of such certificates representing such shares, properly endorsed, assigned for transfer subject to the terms of this permanent trust, any of the shares thereby represented in the manner prescribed for making such transfer.

Twelfth—The trustees shall immediately advise the company, by writing, addressed to the secretary, of any transfer of ownership of any of the shares held by them; and shall, on written request of the treasurer of the company, certify to him the names and residences of all equitable owners of shares held by them in trust; and shall sign warrants for the payment to such owners, severally, of any dividends to which they may be entitled on the share so held in trust.

Third—This agreement may be changed at any time only with the consent in writing of the Pure Oil Company, three-fifths of the persons at the time acting as trustees, and of the equitable owners of three-fifths of the shares held in trust thereunder.

Fourth—This agreement may be cancelled, and the trust hereby created dissolved, only by the winding up of the Pure Oil Company, or by the consent in writing, duly executed, of the equitable owners of four-fifths of the shares held in trust hereunder, and of four-fifths of all the other shares of the company, after providing in full for the redemption or purchase, at one hundred and ten dollars per share, in cash, of all the preferred and common shares of the company at the time outstanding.

Fifth—The said Thomas W. Phillips, Lewis Emery, Jr., Rufus Scott, Clarence Walker, Louis Walz, James W. Lee, David Kirk, Marcus L. Lockwood, Jerome B. Akin, Charles H. Duncan, Hugh King, Michael Murphy, Adolphus A. Hoch, Ferdinand Reiber, and Walter A. Dennison hereby accept the trust herein conferred and imposed on them.

In witness whereof the parties hereto have severally signed this agreement as of the 6th day of November, A. D. one thousand eight hundred and ninety-five.

PURE OIL COMPANY.
David Kirk, President.
C. H. Duncan, Treasurer.

Incorporators: David Kirk, Jerome B. Akin, Marcus L. Lockwood, Walter A. Dennison, C. H. Duncan, Theodore B. Westgate, James W. Lee, David Kirk, trustee for McCalmont Oil Company, W. L. Curtis, Thomas W. Phillips, David Kirk, Marcus L. Lockwood, Clarence Walker, James W. Lee.

Trustees: Walter A. Dennison, Jerome B. Akin, C. H. Duncan, Adolphus A. Hoch, Ferd. Reiber, Louis Walz, Rufus Scott, Lewis Emery, Jr., M. Murphy, H. King.

EXHIBIT A.—BY-LAWS AND RULES AND REGULATIONS OF THE PURE OIL TRUST.

[Incorporated Nov. 8, 1895. Capital, $1,000,000.]

The objects of the company are to produce, purchase, transport, store and sell crude petroleum and its products and to protect and to aid other companies and parties in the production, transportation, manufacture, storage and sale of the same. The corporation may acquire, hold, maintain and dispose of any stocks, shares, bonds and other interests in or issued by the corporation, joint-stock, or limited partnership association engaged in or aiding or promoting the producing, transporting, storing, refining, and selling of crude petroleum or its products, or in any business incident thereto.

BY-LAWS.

ARTICLE I.

Meetings of the Shareholders.

Section 1. The annual meeting of the shareholders shall be held at the principal office of the company on the fourth Wednesday of January in each year, commencing at 10 o'clock a. m., standard time.

Notice of the annual meeting of shareholders shall be by written or printed letter addressed by the secretary to each shareholder at his or her last known place of residence, and mailed ten days prior to the time fixed for holding such annual meeting.

Sec. 2. Special meetings of shareholders may be called whenever it shall be deemed advisable by the board of directors, or by the president upon request in writing signed by the shareholders owning collectively not less than one-third of the shares of the company.

Notice of special meetings shall be given in the same way as the notices of the annual meetings.

Proxies.

Sec. 3. Shareholders may be represented at any meetings of the shareholders by proxy, duly authorized in writing, executed within thirty days next preceding the meeting.

Quorum.

Sec. 4. The legal representatives of a majority of all the shares of the company shall constitute a quorum at any meeting of the shareholders; and without a quorum being present or represented by proxy no less number may adjourn from time to time until a quorum be present.

Voting.

Sec. 5. At meetings of shareholders, general or special, all votes upon disputed questions shall be by ballot, if demanded by any shareholder present, and all votes by ballot shall be determined by the number of shares represented by the respective votes cast.

At all meetings of shareholders for the election of directors, each shareholder shall be entitled to cast as many votes as he has shares of the company standing to his name on the books of the company.

The election shall be by ballot, and each ballot shall have endorsed thereon the name of the person casting the same and the number of shares represented thereby.

Vacancies.

Sec. 6. In case of death, resignation, or removal of any director, the vacancy shall be filled by the remaining directors.

Tellers.

Sec.7. The directors shall appoint two shareholders as tellers to conduct the election and to certify the result in writing to the parties elected and to the president and secretary of the company. In case of the directors failing to so appoint, the shareholders present shall choose two tellers to conduct the election.

The secretary of the company shall furnish the tellers, for their guidance in conducting the election, a list of shareholders, showing the number of shares standing in the name of each on the books of the company, authenticated by the seal of the company.

Time of Election and Term of Office.

Sec. 8. The polls shall be open from two to three o'clock p. m. The terms of office of directors shall commence at noon on the first Wednesday after their election at the annual meeting of stockholders and continue until their successors are duly elected and seated.

ARTICLE II.

Directors—Meetings.

Section 1. The board of directors shall fix the time and place for holding its meetings.

Special meetings of the board may be held at any time on the call of the president or any two directors, after due notice given to each of the directors.

Election of Officers.

Sec. 2. At the first meeting after their election the directors shall organize by electing from their number a president and a vice president to serve until their successors are qualified, and appointing a secretary and a treasurer to serve during the pleasure of the board.

Quorum.

Sec. 3. A majority of the directors shall constitute a quorum at any meeting of the board, and no business being present.

Salaries.

Section 4. The salary of the president and vice president shall be fixed by vote of the stockholders.

Executive Committee.

Sec. 5. For the more prompt and efficient management of the affairs of the company there shall be an excutive committee of the board, consisting of the president, vice president, and three other directors, who shall be appointed by and hold office during the pleasure of the board. In the intervals between the meetings of the board of directors its powers and executive committee shall be subject to the approval of the board at its next regular meeting.

The proceedings of the executive committee shall be duly recorded in the same manner as the regular proceedings of the board of directors.

A majority of the executive committee shall constitute a quorum.

In case of disagreement of the executive committee board of directors.

Minutes.

Sec. 6. The board of directors shall cause to be kept a complete record of their official proceedings and acts of the proceedings of all shareholders' meetings; present to the shareholders at the annual meeting a statement of the assets and liabilities of the company and of the condition of its affairs generally.

ARTICLE III.

Powers and Duties of Officers—President.

Section 1. It shall be the duty of the president to preside at all meetings of the board of directors, to sign all certificates of stock and warrants for the payment of money ordered by the board of directors, and such other papers as he may be ordered by the board of directors to execute on behalf of the company.

In case of the absence or inability of the president to act, the vice president shall be invested with all the powers and shall perform all the duties of president. In case of absence or inability to act of both president and vice president, the board of managers may appoint one of their number president pro tem., who shall during such absence or inability perform all the duties of president.

Secretary.

Sec. 2. The secretary shall keep the minutes of the meetings of the board of directors in a proper book provided for that purpose; attend to the giving and publication of all notices of the company, unless otherwise provided for by the board of directors; have the custody of the seal of the company and affix same to all certificates of stock and such other papers as the directors may order; countersign all warrants on the treasury for the payment of money, which shall have been previously signed by the president as authorized by the board of directors; attend to such correspondence as shall be assigned to him; act as secretary of all standing committees of the board, and shall in general, under the direction of the board of directors, perform all the duties incident to the office of secretary of the company.

Treasurer.

Sec. 3. It shall be the duty of the treasurer of the company to receive and deposit or hold and pay, as the board of directors may order, all funds resulting from the sale of shares or any property of the company; and shall sign all stock certificates and obligations of the company created by special order of the board of directors.

The treasurer shall give bond for the faithful discharge of his duties in such amount and with such security as the directors may determine.

RULES AND REGULATIONS.

1. The business of the company shall be the producing, purchasing, transporting, storing and selling of crude petroleum and its products, and aiding other companies and parties in the production, transportation, storage, manufacturing and sale of the same. The corporation may acquire, hold, manage and dispose of any stocks, shares, bonds and other interests in or issued by any corporation, joint stock company or limited partnership association engaged in, or aiding, or promoting the producing, transporting, storing, refining and selling of crude petroleum or its products, or in any business incident thereto. And in addition to the powers hereinbefore provided for, it may also purchase, hold, manage and sell on commission, or otherwise, such investment securities and other property, real, personal, and mixed, as the corporation may be generally or specifically authorized in writing from time to time, by the owners and holders of a majority in number of the shares of the capital stock of the company, to purchase, hold, and sell.

And the company may exercise such trusts and do such other things, not inconsistent with its charter, as it may from time to time be authorized in like manner to do.

2. The principal office of the company shall be located at Jersey City, in the county of Hudson and State of New Jersey, and branch offices may be established from time to time as may be determined by the consent of the owners and holders of three-fifths of the shares of the company.

3. The shareholders shall make rules and regulations and by-laws for the government of the company and the management of its business and affairs as in their discretion they may deem advisable, which may be amended at any time by the consent of the owners and holders of three-fifths in number

of the shares of the company, given in writing, filed with the secretary, and recorded in the minutes of the proceedings, both of the shareholders and directors of the company.

4. The affairs of the company shall be managed by a board of directors, consisting of nine members, to be elected annually by the shareholders at their annual meeting, at which each shareholder shall be entitled to cast, personally or by proxy, one vote for each share of stock in the company held by such shareholder. The directors shall choose annually from their own number a president and vice president to serve until their successors are chosen; shall appoint all other officers, managers, agents or employes of the company; prescribe the duties and fix the compensation of each; and may suspend or remove any of them at discretion, and they may make such additional by-laws as may be deemed by them advisable—all subject to the by-laws and rules and regulations adopted by the shareholders for the government of the company.

5. Interests of the company will be represented by shares which may be divided into classes, including preferred, common and deferred shares, to be issued, held and transferred, subject to the by-laws and regulations of the company.

The preferred and deferred shares may be each subdivided into various classes, each class having such special rights and limitations as will more particularly adapt them to the uses for which they are intended, subject to such relation to the shares of other classes as may be established in their issue.

The rules and regulations relating to them will embrace the following features:

6. A majority of all the shares of the company shall be held in a permanent trust approved by all the shareholders, to secure the control of the company and the faithful maintenance of the policy agreed on for conducting the business of the company in the interest and for the protection of all concerned in its affairs. The shares so held shall be designated as trust shares.

7. The capital of the company shall be the net amount of cash paid into the treasury of the company for its permanent use as the proceeds of its stock issued and sold for cash for account of capital; and no credit in excess of the amount shall be made to "capital" in accounts or statements of the company.

8. No preferred stock shall be issued except as cash to the extent of one hundred dollars for each share of such stock issued shall be paid into the treasury of the company to the credit of capital, or of surplus, or of the guaranty and redemption fund, to be created as prescribed in section 12 hereof, as may be deemed advisable.

Any of the preferred shares may be converted, at the option of the holder, into common or deferred shares by so stipulating in their issue and distinctly stating the right of conversion in the certificates representing them; otherwise they shall not be convertable.

9. The deferred shares of the company may be issued for cash, investment securities, property, services, payment of expenses, making disbursements of any kind, and in exchange for shares of other classes issued by the company at the discretion of the directors, with the written consent of the owners of a majority of the shares of the company at the time outstanding.

10. The holders of preferred stock shall be entitled to receive cumulative dividends thereon of one dollar and a half per share quarterly, in full, before any dividend shall be payable on the common stock.

11. A guaranty and redemption fund shall be created and maintained by crediting thereto all of the cash received by the company from the following sources:

(a) The proceeds of all shares of the company sold for cash by the company when issued, in excess of the amount credited to capital.

(b) The cash proceeds of all shares, securities or other property of whatever kind acquired by the company in exchange for its shares of any class, as such proceeds may be realized, at any time, by the sale for cash of any portion of such shares, securities or property.

(c) The proceeds of all shares, of whatever class, purchased by the application of the guaranty and redemption fund, as authorized, and resold for cash by the company.

12. The guaranty and redemption fund shall be applicable to the general uses of the company, but may be applied to buying shares of all classes, in the order of their priority or right to dividend, as stipulated, at the lowest rates at which any shares of the same class can be bought, not over one hundred and ten dollars per share, on demand of the several owners and holders of shares, respectively, made within a prescribed time after the payment of dividends; provided, notice of the intention to make such demand shall have been given to the secretary of the company thirty days before the time fixed for the declaration of dividends; and provided further, that no part of the guaranty and redemption fund shall be applied to buying, at any price, the shares of any class, so long as there may remain unsatisfied any demand made by the owners and holders of the shares of any prior class to have the same redeemed at not over one hundred and ten dollars per share.

All shares so purchased shall be placed in the treasury, to be used for the benefit of the company in such form and manner as may be determined by the directors, with the consent, in writing of the owners and holders of a majority of the shares of the company.

13. When no shares of any class can be purchased at one hundred and ten dollars per share, the guaranty and redemption fund shall be applicable, at the discretion of the directors, to the purchase of the shares of the several classes, other than the trust shares, at such rates above one hundred and ten dollars per share as may be approved by the owners of a majority of the shares of the capital stock.

The shares of any class so purchased may, when

authorized by the owners of a majority of all the shares of the company, be resold at any time, at the discretion of the directors, at any price not less than that at which they were severally purchased; or they may be retired from the classes to which they belong, and be placed in the treasury of the company, to be held, reissued, and sold for its use and benefit, subject to such conditions as the directors may prescribe, in accordance with the regulations of the company.

14. When the dissolution of the company shall be determined on, voluntarily or otherwise, the trustees, acting under the permanent trust, created and prescribed in section 6 hereof, shall be trustees to convert its assets and wind up its affairs. The proceeds of all assets received by them shall be applied by them absolutely, as the guaranty and redemption fund is required by the rules and regulations to be applied, preceding, and as may be further prescribed hereinafter.

Any portion of the guaranty and redemption fund remaining after providing for the purchase and retirement of all shares, as herein prescribed, shall be distributed to the owners of the trust shares, and of any other shares then outstanding, equally per share.

15. The owners of a majority of the trust shares, acting together, shall have the right to convey to the company, absolutely or in trust, permanently or temporarily, and subject to such conditions as may be stipulated in such transfer, any securities regularly yielding net income; provided, that the receiving and holding of such securities shall not subject the company to any prejudice, or embarrassment, or legal liability to pay any money on account thereof; and no such temporary transfer in trust shall be terminable until the well-established net income of the company from its regular business and other sources of permanent revenue shall be equal to the maximum amount to which it may be raised by such temporary transfer in trust.

16. Each holder of shares standing in his name on the books of the company shall be entitled to a certificate or certificate therefor, duly signed by the president and treasurer, with the seal of the company affixed and attested by the secretary of the company, and each owner of an interest in any of the trust shares shall be entitled to a certificate of the fact, signed by the chairman and attested by the secretary of the permanent trust, showing the extent of the interest, which interest shall be assignable and transferable on the surrender of the certificate representing it, properly indorsed, as may be prescribed by the trustees, with the approval of the directors and the owners of a majority of the trust shares.

THE UNITED STATES PIPE LINE NOT ABSORBED BY THE PRODUCERS AND REFINERS' OIL COMPANY.

I want to correct some testimony given in connection with the proposed consolidation of the pipe line interests and which referred to the Pure Oil Company and its allied concerns. Refreshing my memory, I find that it was not proposed to buy the United States Pipe Line Company. From correspondence here in this document, it seems that the facts are just the reverse, and that the United States Pipe Line Company proposed to buy, with the consent of the Producers' Oil Company, Limited, the property of the Producers and Refiners' Oil Company, the payment therefor to be made in stock of the United States Pipe Line Company, the stock of that company having been increased for the purpose from one to two millions of dollars, or it having been proposed to increase it to that amount.

THE NATIONAL TRANSIT COMPANY IN THE M'DONALD FIELD.

The commission having indulged me in a wish to read a description of the conditions existing throughout the McDonald field during the time when the original company and the association were in existence, in 1891, I desire to do that before taking up the consolidation of the various interests. This is taken from the Pittsburg Commercial Gazette, and is reprinted in the Oil City Derrick of May 5, 1892. It is entitled "A History of the Manner in Which the National Transit Company Handled the Output of Oil at McDonald."

"A few days ago the superintendent of the National Transit Company's tank department made an official report, in which he said: 'A retrospect of the work done proves conclusively that vast resources are required to cope with floods of oil such as were poured forth by the Cherry Grove and McDonald fields, and that nothing short of the experienced and well-equipped organization that did the work could have accomplished it.

"'In round numbers, 10,000 tons of iron, rivets, lumber and other building material were shipped into the McDonald field by one department alone—the tankage department—and the tankage provided for at the rate of one for every ten working hours, requiring the handling, on an average, of 150 tons of material per day to keep the large force of workmen employed. Special trains were run for the accommodation of the men and no expense spared to meet the demands of the field. Rolling mills and tank shops were pressed to their utmost capacity, in many cases running night hours to meet the extraordinary demands made upon them, and second-hand tankage, wherever it could be spared, was cut down and made to do service again in the new field. Men skilled in the special work of tank building were sought for and transported to building points from Chicago, Brooklyn, and all the cities and towns of oildom, east and west, until their name was legion. More than a score of sawmills were drawn upon to furnish the lumber at the rate of thousands of feet per day to roof the huge oil receptables.

"'In addition to this force were the graders, turning out two and more tank grades per day. The Chartiers Valley presented a scene of activity rarely

witnessed since the days when armies were similarly engaged throwing up temporary fortifications. For miles teams, laden with iron, rivets, sheet iron, etc., were seen hurrying in seemingly endless confusion, and yet all were under proper direction, each going to a designated point, arriving in such order as to prevent loss of time from want of material, for there was no surplus, no reserves. Everything was used on arrival, and special agents, laboring over overtaxed railroad officials, to hurry forward supplies, others seeking belated cars on side tracks; the wires brought into requisition; the express companies shipping rivets, plate iron, and many other articles, which ordinarily were shipped by freight. It was no longer a question of expense, but simply a question of securing supplies as fast as required, by whatever means. Scarcely time for sleep, none for recreation; it would come later, as it did. Besieged everywhere by the owner, or expected owner, of a flowing well, with the ever-present and ever-recurring question, "When will you complete the next tank?" "To-morrow," the answer came uniformly, and so did the tank, but only to be filled at once and the necessity for another equally great pressing upon us.'

"This vigorous, graphic and conservative statement as fully borne out by the facts, and gives an excellent pen picture of the excitement and fierce activity attending the development of that prolific territory. This was the work of but one department and involved merely the building of the iron tankage, which still stands in the McDonald field to show for itself what was done. But it does not involve that still mightier work of moving into the McDonald field the pipes for the miles of lines required to run this oil from the wells of the producers to the markets of the world, or where it might be fitted for such markets; it says nothing of the great pump stations which were erected at both McDonald and Greggs stations, on the Panhandle Railroad, to care for this enormous output of nature's wealth, or of the pumps in every valley of that field; the boilers and engines necessary as motive power to all this machinery needed to move into the flood of oil which poured forth from this, the most prolific white-sand field ever developed on this continent.

"The McDonald field is about six miles long by two miles wide, or contains in the vicinity of 12 square miles, yet the pipe line company has shipped into that field 55 miles of two-inch pipe, 41 miles of three-inch pipe, 25 miles of four-inch pipe and 32 miles of six-inch pipe, a total of 153 miles of pipe, or over 11 miles of pipe for every square mile of territory, and all this merely to carry the product from the wells to the mains of the company, which had been previously laid from the Washington field to the grand deposits at Olean, in New York, on the trunk line to New York, and to Colegrove, connecting with the trunk line to Philadelphia. Neither do these figures include 70 miles of six-inch pipe from Greggs station to Bear Creek, as an additional outlet deemed necessary, owing to the possibility that the increasing production might become greater than the capacity of these two main lines to carry.

"The field itself is but about a year old, and all this work, or by far the greater part of it, was done between the middle of July and the beginning of November, 1891. The plant is completed, with the exception of laying such lines as may be necessary to connect new wells as they come in; the pipe line business has assumed its usual routine under the facilities provided by the gigantic system established; and while the output of the field is still large, it is handled without the slightest ripple of excitement. Not only the iron tankage with a capacity of 3,000,000 barrels of oil stand there, but the mighty pumps at the stations at McDonald and at Greggs are living and pulsating evidences of the achievement.

"There was much accomplished, however, which cannot appear to the mere observer in the field. Superficial examination in the erection of a plant of this size within such a brief period of time, a plant that is as permanent as the field itself, working with the smoothness and perfection of one which might have occupied years in its construction. Neither can a superficial observer see the expensiveness of certain features unless he be an expert in the handling of oil.

"The field itself is one succession of hills several hundred feet in height, with correspondingly deep hollows. There are wells on the hills as well as in the hollows. Very large producers were so situated that there was no advantage to the pipe lines from gravity whatever; everything had to be forced by pumps, a result of some wells being so much lower than others and the high pressure at which the lines were used, requiring the use of a pump station in every productive valley.

"The haste with which construction had to be prosecuted is faintly indicated by the growth of production in the oil field. The first well completed was the Royal Gas Company's well, in February, 1891. It was drilled for gas, and the field has accordingly been not only a surprise, but is also an accident. This was followed by Sauter's No. 1, which wells were connected with the main discharge line of the National Transit Company by two-inch pipes. The next well of any importance was the Matthews, situated about midway between the McDonald and the McCurdy field, already developed. It got some oil in the Gordon sand in the spring of 1891, and was a small well, say 10 or 12 barrels daily. This was connected in the usual way.

"To the beginning of July there had been no such volume of production as to cause any unusual effort to care for, or to transport. But in the early part of the month of July the Clark & Bannister well on a town lot in McDonald, struck the fifth sand and started off at 30 barrels per hour; the Matthews, already referred to, more than two miles distant, struck the same sand about the middle of the month, and was credited with 40 or 50 barrels per hour. Sauter's No. 3, as if envious that McDonald should be outdone by that out-in-the-country well, went to

the fifth sand and also came in with a jump at 120 barrels per hour.

"This was not a theory, but a condition that had to be faced. The production must be cared for. A pump station was begun at McDonald without delay. Transportation had to be forced. The capacity of the lines at the beginning of July was but about 3,000 barrels daily. This evidently would have been inadequate to run such an outpouring of oil as was going on. The production of oil by the middle of August was up to about 15,000 barrels per day. By the first of September the lines could handle 26,000 barrels per day. The production increased and exceeded that amount. By the first of October the lines could handle 40,000 barrels per day. The petroleum still increased; the race between production and the capacity of the company to handle it became fast and furious. By November the production on some days was up to the vicinity of 80,000 barrels per day, but by the first of December the capacity of the pipe line had been increased so that it was able to handle 90,000 barrels per day, if necessity should arise.

"That day has not come. The production began growing less after November, but the plant of the pipe line company is none the less. It not only erected a plant capable of handling, but actually received and run such a volume of oil as can scarcely be comprehended. The amount of oil carried away from the McDonald field in November, if carried in cars, would have required a train of 25 full loaded cars to have been run more than once every hour, day and night, to have carried it. More than 750 cars would have been required. The plant able to move such a weight is necessarily large as well as powerful, and much machinery is necessary.

"But keeping the machinery in motion was one of the difficulties encountered in that field and successfully overcome which might have been a fatal obstacle to a less thoroughly equipped organization. The water available in the vicinity of the operations was so bad, owing to coal-mine drainage, that it could not be used for the boilers. It became necessary to pipe all the water from the Ohio River and Montour Run. The injury to the boilers before the water pipe system was completed caused the expense of a large number of boilermakers for 10 weeks. The water system from the Ohio River and Montour Run covered about seven miles, but it was subsequently found that a saving in distance could be effected by building a water station in Bridgeville, from which a three-inch main was run and is now supplying that field.

"The conditions under which this plant was erected also involved the difficulties, delays, vexations and additional expense of the means of transportation of material being in pressing demand by all manner of interests in the newly-developed field. Operators were anxious to get their machinery and tools to their leases at the earliest possible moment; well-supply companies were making demands for transportation with all the vehemence possible to exercise; merchants and craftsmen attracted thither added their mite to the pressure, not only upon the railroad company to various stations adjacent to the field, but also for teams to transport their boilers, engines, rig timbers and building material, stocks of goods, supplies for man and beast, teams were brought into requisition to the number of many hundreds; the movement of teams was necessarily slow, and accident to one was the concern of all, as the delay stopped the procession of loaded wagons for miles; a single car on a switch might delay the whole train; but one side track was available at any of the stations on the railroad near the field; a veritable army of men was employed; the work went on night and day under competent direction; as one gang quit for rest and sleep another went on, gas furnishing the electric light by night, so there was no pause from the beginning of the line or of a pump station until it was completed; the whole plant including 64 boilers, some of them 80 horsepower; 145 pumps of various sizes, from the small ones in the valleys to the powerful works at the pumping station, with appropriate engines, all brought in, set up and put in running order, supplied with water brought through miles of an artificial water system; about 150 miles of pipe lines in the field and 70 miles of large main out of it; iron tankage, with a capacity of 3,000,000 barrels, all erected and completed within the brief period of four months. It is a triumph, whether viewed as an achievement of American enterprise, or the result of business organization which enables such vast resources to be placed at the disposal of productive industry so promptly, skillfully and advantageously to the development of natural resources."—Industrial edition of the Pittsburg Commercial Gazette.

At this time the Producers Oil Company, Limited, owned only a private line on the margin of the field probably sufficient to handle 2,000 barrels a day, and during the four months it did not increase beyond five to six thousand barrels a day. If that production had been dependent upon that one line, it would have gone to waste or not have been produced.

POSSIBLE EFFECTS OF A FREE PIPE LINE LAW.

Q. There might have been a free pipe line law in Pennsylvania, which was opposed by the Standard Oil Company for years, and finally granted. Do you not think that there would have been pipe lines of sufficient capacity to have taken care of the oil, if the producers had had the right to build them in our State, if they had had the right of eminent domain? Is it fair, therefore, to instance the capacity of a single pipe line, just starting up, to care for the whole field? A. To begin with, we will have to assume that the producers, or the persons engaged in constructing the pipe lines, under a free pipe line law, previous to 1877, would have been willing and satisfied to form a compact organization, to put in sufficient capital, and to continue to act as a unit, as the persons owning the existing pipe line interests there have done. If all these things could have been brought about, then I be-

lieve it would have been possible to have had enough lines there, but the constant co-operation of all the parties interested would have been necessary. They would necessarily have been obliged to be united on every proposition, and that was something that was never accomplished before; nor has it been since.

Q. Do you not believe that the pipe line industry would have held out just such inducements as the railroad industry has to the country, that there would have been two or three large competing lines in the field, and that the burden of taking care of that oil would not have been self-imposed by the Standard Oil Company? A. All we can judge is by what did occur at the time, when there were a great many competing organizations. There were one or two strong pipe lines, and they were owned by one or two strong railroad companies, and managed, in part or in whole, either openly or by agreement.

Q. It was then a growing industry—away back before it was monopolized? A. It was not a growing industry. It was overproduction. There was no pipe line in the business previous to the organization of pipe lines in 1877 that had made a dollar.

Q. That was in the infancy of the business and you could not expect to have the kind of capacity you have described. Do you maintain that one company, be it the Standard or anybody else, would be better for the oil country, for producers and consumers, and all, than several large, responsible competing companies, which undoubtedly would have been formed if there had been the right of eminent domain, and if the builders of pipe lines had not been opposed in getting it by the Standard Oil Company itself? A. I never understood that the Standard Oil Company directly opposed it. The Standard Oil Company was not in the pipe line business until the time of the great opposition and agitation for free pipe line laws. They did not go in until 1877.

Q. Was there not a great effort made in Pennsylvania to get the right of eminent domain, and did not the Standard Oil people, or the National Transit Company, which you say is controlled by the Standard or is a part of their system, oppose the giving of the right of eminent domain? Had they not secured the right of way by purchase through the State and across the railroads, and when other companies undertook to do that, did they not lease and purchase ground in front of their right of way, and did not the railroads oppose the other companies passing under or over their ground? Was it not impossible for a number of years for other people to get to the seaboard after the Standard or the National Transit Company had secured their right of way? A. I do not so understand it. I never knew of but one instance of the right of way being secured.

Q. (By Representative Livingston.) May I ask what this testimony about the pipe lines leading up to, simply a history of well digging? A. It is to show the manner in which it is done, and the uselessness of the opposition attempted by the Pure Oil Trust—its uselessness and inability to do any business where it was required.

Q. You want to show them that the oil company could not do any business on account of their being hampered by the pipe company? A. No; they were not hampered by the pipe company. They were not able to do anything after they had taken it, and then bought a charter and were not obliged to do anything that they wanted. It was a limited concern; it was not organized under the pipe line laws of the State; it was a private company. Its purpose was, in other words,, to establish the latter movement of the Petroleum Producers' Association, and was a dog-in-the-manger policy—a going into business for the purpose of annoyance, without rendering any useful service to the State.

Q. (By Mr. Phillips.) I wanted to get at the reason why there were not other large companies in opposition. A. I never knew of the Standard Oil Company placing obstructions in the way of the construction of any pipe line. I have known of individuals obstructing the Standard Oil Company's operations. I have known of that.

Q. After the Standard Oil Company, or rather the National Transit Company, had assumed control, were there not some twenty-odd pipe line companies formed to supply the refineries from the local fields? It has been stated here by other witnesses that there were some twenty-odd. Now, do you admit that there were a number that went into local fields? Oh, yes.

Q. After the National Transit Company had control? A. Yes.

PREMIUMS PLACED ON OIL BY THE NATIONAL TRANSIT COMPANY.

Q. Now, is it not the rule of the National Transit Company to place a premium on oil in all those fields in order to add to the price of oil, so that the local men can not handle it? Has that been their rule or not? A. Some instances have come under my own observation of pipe lines being constructed into new and prolific fields for special purposes. I have one in mind in Oil City. It started, I think, as the Peerless or Keystone pipe line. It changed its name so often that I could not keep track of it. That line did not come in as a competing line in the field, and the condition upon which it entered was a guaranty of a certain amount of oil at a fixed rate of pipage. The pipage rate was fixed at five cents below the existing rates of the National Transit Company, which was virtually a bid for that oil—a bid of five cents—and was in itself a premium of five cents. The competing company then necessarily went out and bid the same figure; the premium was a bid to get the oil.

Q. You know a few years ago there was quite a line started in the Washington field, to which you have referred. It is known, I believe, as the Craig-Elkins Line, or the Western and Atlantic. Did not the Standard put a premium on Washington county or Butler county oil while that line was in existence? A. For the reason I have stated the oil was bid away from

them by these co-called independent companies coming in.

Q. I do not so understand it? A. That is as I understand it.

Q. Did not the National Transit Company eventually purchase that line? A. That is the assumption.

Q. Then did not they take off the premium? A. I do not believe that there is any premium on that oil now.

Q. But did they not reduce the price of oil seven cents per barrel to the producer the day or the next day after the purchase was made A. If you will give me the dates I will refer to this book here. I can not state it from memory.

Q. I can not at this time. You have no knowledge? A. I have no knowledge on that subject.

Q. There has been a new field, called the Scio field, opened up in the last two years. Is there not an independent pipe line in that field? A. I have heard there were some people bidding for oil there.

Q. Is there a premium placed on that oil? A. I believe there is.

Q. Is that oil better than any other oil? A. It is said to be; it is equal to the Clarendon oil.

Q. Has there not very frequently been a premium put on oil, being claimed that it was better, which was afterwards taken off when the opposition ceased? A. I have knowledge of premiums being placed on oil, and I have knowledge of premiums being taken off; but I have no knowledge of the purpose of those premiums.

PIPE LINES WHICH HAVE PAID REBATES.

Q. (By Mr. Farquhar.) What pipe lines have paid rebates to producers, and when and how did they pay them? A. The Mutual Pipe Line paid a rebate of five cents a barrel.

Q. (By Mr. Smyth.) Is that an independent pipe line? A. They were all independent pipe lines in those days. They entered into a contract. I have some figures here on the subject. These rebates to which I refer now were a matter of common knowledge so far back as 1878. Some time after the close of that movement one of the persons connected with it made a demand upon the Union Pipe Line for a rebate and gave his reasons, which will appear from the following correspondence. I am reading now from a letter head of the Bear Creek Refining Company, Limited:

REBATE.

B. B. Campbell, chairman. R. P. Crawford, treasurer. Bear Creek Refining Company, Limited, refiners of petroleum. City office, corner Etna and Eleventh streets, Pittsburg, Pa., October 22, 1884.

The following correspondence demanding rebates on pipage passed between R. P. Crawford, treasurer of the Bear Creek Oil Refining Company, and Mr. O. P. Swisher, of the United Pipe Lines Company. Then the correspondence was transferred from Mr. Swisher to Mr. Henry McSweeney, solicitor for the United Pipe Line:

Letter No. 1. Under the above letter head, with a Pittsburg date line, on the date above mentioned, Mr. Crawford writes:

Mr. O. P. Swisher.

Dear Sir: I am informed that your former attorney, Mr. Hancock, has been superseded by Mr. McSweeney. I wish the latter to get the enclosed. If not addressed properly, please see that it gets in the proper hands.

Yours sincerely,

R. P. CRAWFORD.

Letter No. 2, written under the letter head of the Bear Creek Refining Company, on even date with the above. Mr. Crawford writes:

H. McSweeney, Esq.

Sir: I met Mr. J. R. Campbell three weeks ago on a train to Oil City. I told him I was anxious to get an old unsettled matter fixed upon a matter of overcharge of pipage on oil from some small producing wells near the mouth of the Clarion river. Mr. Campbell told me to write you on the subject. In the days of the old Mutual Line (G. R. Harms, manager,) we found oil on a lease obtained from Hon. Thomas Mellon and R. Galey, Sr., about one mile from the mouth of Clarion river. We had completed our arrangements to lay our own pipe lines to the railroad. Mr. Harms came to see me, and he agreed to 15 cents pipage for all the oil from the lease above referred to, but not to extend to any other leases. The pipage at that time was settled monthly. I have the papers to show such settlement. The Union, Empire, United, and National Transit have, in succession, fallen heir to the arrangement. It has been investigated several times—by Mr. Hatch for and in behalf of the Union (afterwards the Empire) Line, by the pipe lines when operated in the pooling arrangement, and by Mr. Waller in behalf of the United, after the purchase by the latter of the Empire Line.

The wells are called Mellon (or Andes) and Brett. The last paid by the United was, up to and including the runs for April, 1879, as follows:

April runs, Mellon, 903.66 barrels, at 5 cents..$45.18
April runs, Brett, 133.01 barrels, at 5 cents.... 6.65

The charge of 20 cents pipage being in excess, we claim an allowance of five cents per barrel on all oil run since that date, and to continue as long as we produce from that particular territory. The wells have run down to small business, but small as the claim may appear I must get it settled, either amicably or by law. I much prefer the former, but one of my partners is a lawyer (B. B. Campbell), and, like all lawyers, is ready for the job. I write this in a spirit of kindness and fairness, as one business man should to another, and trust it will receive your prompt and careful consideration.

R. P. Crawford, Trustee.

To which Mr. McSweeney makes reply under date of Oil City, October 23, 1884.

R. P. Crawford, Esq., Pittsburg, Pa.

Dear Sir: Your letter of the 22d instant claim-

ing overcharge of pipage is received. Please send me copies of all papers upon which you base your claim, as well as a full and specific statement of the amount alleged to be due you, etc. As soon as I hear from you I will carefully examine your claim and advise you as to the result.

Yours, truly, H. McSweeney.

Letter No. 4, written on the letter head of the Bear Creek Refining Company, Limited:

Pittsburg, Pa., November 14, 1884.

Mr. H. McSweeney,

Dear Sir: I answer yours of 23d ultimo as follows: I inclose sheets marked Nos. 1 and 2, showing runs from Mellon or Andes wells (two numbers), and from Brett wells, upon which there is due five cents per barrel:

Andes or Mellon, 25,199.65 barrels, at 5 cents	$1,259.98
Brett, 2,061.84 barrels, at 5 cents	103.09
Total	$1,363.07

I also inclose sheet No. 4, showing a few runs from each Mellon and Brett, running backward of runs upon which five cents per barrel overcharge was paid, to give you a start toward tracing it. As to the contract, I refer you to Charles P. Hatch, Roanoke, Roanoke county, Va., formerly manager of the Empire Pipe Line, also John T. Galey, who was stockholder in the contemplated pipe line from these wells. Thomas F. Galey, Pollock postoffice, Clarion county, Pa., can give John's address. I do not know where G. R. Harms is at present. The last I heard from him he was at Cincinnati, Ohio. There is no doubt about this claim being a just one. It is just what Mr. Hatch called it, "an overcharge," and knowing all about it, I say the same thing. I think Mr. O. P. Swisher could tell you something about it, if he will be kind enough to freshen his memory.

Hoping to hear from you soon, I am, yours, respectfully, R. P. Crawford, Superintendent.

Letter No. 5, on letter head of Bear Creek Refining Company, Limited:

Pittsburg, Pa., November 15, 1884.

H. McSweeney.

Dear Sir: In making up the account for the overcharge pipage, which I mailed to you yesterday, I left out the old Galey well, which was included in the contract. It is a very small producer, and if the others are settled, I will let it go. I sold it last spring and have nothing to do with it now.

I wish to say to you frankly that we made a mistake agreeing to 15 cents per barrel pipage from those regions, as we should have built the line, which would have been but a fraction over one mile and pumped our oil to the railroad at less than five cents per barrel. But the contract was made, complied with for years, and now I only ask for compliance of same.

Respectfully,

R. P. Crawford, Superintendent.

Letter No. 6, on letter head of the Norfolk and Western Railway Company, Charles F. Hatch, general freight agent:

Roanoke, Roanoke County, Va.,
November 24, 1884.

H. McSweeney, Esq.,

Solicitor National Transit Company, Oil City, Venango county, Pa.

Dear Sir: I have your favor of 20th, referring to the matter of the claim of R. P. Crawford against the National Trinsit Company on account of alleged overcharge on pipage of oil produced from wells drilled on lands leased from Hon. Thomas Mellon and Robert Galey, on Clarion River, about one mile from the mouth.

When the Empire Transportation Company purchased the Mutual Pipe Line in 1872, we found among others was a contract, entered into by Messrs. Martin and Harms, owners of the Mutual Pipe Line, and R. P. Crawford and others upon the subject mentioned, by which the Mutual Pipe Line agreed to transport the oil from wells mentioned at a rate of 15 cents per barrel.

This agreement was an oral one and there was no written agreement embodying it, but the facts were conceded upon the representation of Mr. Crawford, as well as Mr. Harms, representing the respective interests. Following this the Mutual Pipe Line and its successor, the Union Pipe Company, continued to transport the oil mentioned at the 15-cent rate, The Union Pipe Company was the name given to the pipe line interests in the lower country belonging to the Empire Transportation Company. When the Empire Transportation Company sold its pipe line property in 1877, all papers and agreements were turned over to the representatives of the Standard Oil Company, or the United Pipe Lines, and, if my recollection serves me right, I gave their representative a statement showing the special contracts and rates for the transportation of oil, among which, I think, was the one to which you refer.

There is no doubt that the agreement referred to was made between Mr. Crawford and Messrs. Martin and Harms, and that it was fully observed, as they owned the pipe line, and that this oral agreement was fully respected by their successors up to the time of the sale of the pipe line interests of the Empire Transportation Company in 1877. The reason for this contest rests upon the fact that, at the time Messrs. Martin and Harms had built their pipe lines, the parties owning the wells on the Clarion River, mentioned above, projected the construction of a short line from the wells to the railroad, and the agreement entered into, establishing a 15-cent rate, was a compromise under which Mr. Craw-

ford and others abandoned their project of constructing the Clarion line.

Yours, very truly.

Charles P. Hatch.

Letter No. 7, dated Oil City, November 20, 1884:

R. P. Crawford, Esq.

Dear Sir: Your favor of the 14th instant, in relation to the alleged overcharge of pipage, was duly received. I will investigate the matter and advise you of the course this company will pursue as early as possible.

Yours, truly. H. McSweeney.

Letter No. 8, on letter head Stadard Oil Company, 44 Broadway, S. C. T. Dodd, solicitor, dated New York, September 15, 1884:

H. McSweeney, Esq., Oil City, Pa.

Dear Sir: About the year 1879 R. P. Crawford, B. B. Campbell, and others caused a quo warranto to be filed against the United Pipe Lines, asking for a forfeiture of its charter upon this ground, among others, that it had made discriminations in its pipage charges. About the same time actions were brought in the supreme court of the State against the Standard Oil Company and the United Pipe Lines and various railroads, the burden of the complaint in each case being discrimination. A criminal action was begun in Clarion county against J. J. Vandergrift, J. D. Rockefeller, and others upon the charge that they had conspired with the railroads to give and receive discriminations in freight. R. P. Crawford was a leading man in all these proceedings. When I investigated the facts, so far as the United Pipe Lines were concerned, I discovered that the only discrimination of which it had been guilty was in reference to several contracts which it had inherited, one of which was the contract to which you refer, between R. P. Crawford, or the Bear Creek Oil Company, and the Mutual Pipe Line Company. The parties who were making all this fuss about the discriminations were the only parties receiving any benefit from the discrimination. They claimed that the discrimination was not only contrary to public policy, but was absolutely criminal. I agreed with them so far as the public policy was concerned, and I directed the United Pipe Lines to repudiate all such contracts R. P. Crawford applied to me frequently in relation to this matter, and I always gave him the same reply, that we would charge the same rate of pipage to every man, and would recognize no contracts whatever for a less rate I do not think that we ought to depart from this line of policy, and particularly not in favor of R. P. Crawford. I would be glad to have him bring suit. If such contracts are good in law, I would like to have it so established at the suit of R. P. Crawford or B. B. Campbell, the parties who so few years ago were endeavoring to put us in the penitentiary for the very thing for from which they now claim the benefit.

Yours, truly, S. C. T. Dodd.

Letter No. 9, dated Oil City, Pa., December 17, 1884:

R. P. Crawford, Esq., Pittsburg, Pa.

Dear Sir: After a careful consideration of the matter, I have decided that this company must decline to recognize the claim made by you on account of alleged overcharges of pipage.

Yours, truly, H. McSweeney,
Solicitor United Pipe Line.

PREMIUMS AND REBATES COMPARED.

Q. What is the difference between putting a premium on a given field when the oil is sold and allowing a rebate to another? What was done to evade the law? A. I think I have already given my view of the question of premiums. I have stated that they are of the nature of a bid when there is competition for a particular grade of oil.*

Q. You do not know of your own knowledge, then, of any premiums being paid where the oil was not any better in one field than another? A. Oh, as to the quality of the oil I am not competent to speak. I am a producer only in a very small way, and I do not care to testify as to the quality of the oil; but I know that the practice of paying a premium was at one time general over the whole region.

Q. (By Mr. Smith.) Who paid those premiums? A. The purchasers of the oil.

Q. It was the custom of the trade at that time? A. Yes; anyone buying oil was obliged to pay a premium.

Q. (By Mr. Phillips.) Did the National Transit Company or the Standard purchasing agency pay this premium on all credit balances? Have they not made it a rule to buy all credit balances at the market value, whatever it was, on the exchange? A. I think that rule was abandoned in 1895.

Q. Well, for a great many years previous to that it was the custom? A. Previous to 1895 they did buy at the ruling price of the exchange.

PRICE OF CRUDE OIL DETERMINED BY THE PRICE OF REFINED.

Q. Now they fixed the price themselves, but the time to which we allude there was this great discrimination? A. If I am expected to answer as to my understanding of the point of their fixing the price, I will say that I do not understand that they fixed the price. The price was fixed by demand, the price of crude oil being reflected in the price of refined.

Q. Who reflects both the price of crude and refined? A. The consumer makes the price. He is the man who states what he will pay.

Q. (By Mr. Smyth.) You stated that it was largely caused by the export demand? A. Yes; wherever the consumer is.

Q. In your judgment the price is fixed by the foreign demand? A. Yes.

Q. (By Mr. Phillips.) Then, when the Standard Oil Company marks refined oil up 10, 15 or 20

points, that is fixed by the consumer, is it. A. My reply was to a different question entirely. I think it is taking advantage of a witness to put it in that way. I have not testified on that branch of the question.

Q. I do not wish to take advantage of you. A. I stated a little while ago that in my opinion the premium is the result of a bid for oil where there is a demand. In districts where there is a demand for oil a premium is usually placed on it just as a premium is placed on leases where there is a demand for land. The producer is carrying out the same idea in competition.

Q. For 15 or 20 years past has there been any special demand by outside refiners? Have not the Standard Oil Company and the National Transit Company handled the great bulk of it? A. You have just mentioned a great line in the Washington field, the Western and Atlantic; that was a demand. It brought capital in large quantities. It employed several millions of dollars.

PRICE OF OIL DETERMINED BY THE DEMAND AND SUPPLY.

Q. (By Mr. Smyth.) Do you think that the fluctuation in the market price of oil is caused by the demand for oil, or is it the result of manipulation on the part of the refiners? A. It is unquestionably the demand for oil.

Q. A larger demand for oil, in your judgment, causes an advance in prices? A. Yes.

Q. And when the demand slackens the production decreases? A. The supply and demand regulate the price. In the documents which I read this morning the complaint of the producers, from the first movements down, has been over-production, and it has been generally admitted that the price is determined by supply and demand.

Q. (By Mr. Phillips.) Has that law worked well in the case of the Standard Oil Company? Have their profits gone down on account of over-production? Has the business not been continually profitable to them, regardless of this law of supply and demand? Do you know any one year, of your own knowledge, in which they have lost money? A. I know nothing about their commercial business at all.

Q. (By Mr. Smyth.) I do not suppose they would admit it. A. I do not suppose anybody would.

Q. (By Mr. Farquhar.) It would simply be a matter of rumor? A. Yes.

Q. Have you, of your own knowledge, ever known of a single statement issued, giving away their business to anybody? A. If it were generally known that any company was losing money its stocks would tumble very rapidly.

Q. Have you ever known of any statement being given out by the Standard under any of the three organizations in which they have been? A. I never have.

THE VALUE OF THE STOCK OF THE STANDARD OIL COMPANY.

Q. (By Mr. Phillips.) What was the capital stock of the Standard Oil Company six or ten years ago? Was it more or less than $100,000,000? A. I think a little less.

Q. How much less? A. Three or four millions, possibly.

Q. Do you know the highest point, or about the highest point that stock ever reached on the market? A. I have heard it stated that it was very close to 500.

Q. Five hundred millions of dollars? A. Yes.

Q. Then the law of supply and demand has not affected them very materially in a great many years? A. Is that for the purpose of showing profits in their business?

Q. I presume that the stock would not be there unless it was earning that; it would not reach that price without having the earning capacity. A. I might say in the same connection that opposition companies show even a greater increase in values. The stock of the Tidewater Pipe Line Company is quoted at from 1,000 to 2,000, I think.

Q. (By Mr. Smyth.) Will you give us the particulars there? What is the capital stock? A. The capital is $10,000,000.

Q. What is the market value? A. Two thousand.

Q. (By Mr. Phillips.) Is not that absolutely under the control of the Standard Oil Company? A. No.

Q. Have they not running rates or agreements with the Standard Oil Company? A. There may be agreements, but it is controlled by themselves.

Q. Are they not limited as to the amount of oil shipped through their lines? A. By agreements—possibly there are agreements there.

Q. Without an agreement with the Standard have you any idea from your knowledge of the business, that the stock would have gone to that price? A. Well, that involves an opinion I do not care to express. I have no knowledge on the subject.

SUITS AGAINST THE PENNSYLVANIA TRANSPORTATION COMPANY.

Q. (By Mr. Kennedy.) You stated yesterday that you knew of one particular pipe line that had been sued on account of misrepresentation in regard to the quantity of oil on hand. Will you now state the name of that pipe line and the circumstances surrounding that suit?

Q. (By Mr. Phillips.) And the date of it? A. The pipe line was the Pennsylvania Transportation Company, and it was some time in the summer of 1876. The suit was brought in connection with the gauging movements, in which false reports had been made about the quantity of oil in the storage tanks, a discrepancy of some 50,000 barrels. The examination of the gauging tanks was a public one.

It was a test or examination of the integrity of the pipe lines at the time, and all lines were examined by agreement of the oil exchanges. A statement was issued by the gaugers of the Pennsylvania Transportation Company that it had 50,000 barrels in excess of the actual quantity on hand, making a misrepresentation to that extent to the trade. Suits were entered against the gaugers, involving the president of the line and the superintendent. Criminal action was brought, I think, in Kittanning, but the case was never tried. But it was common in those days, the early pipe line days, under the wild cat pipe line systems, for pipe lines to be short. Subsequently to 1874, when the pipe line law, requiring the publishing of statements of the condition of the line and its responsibility, went into effect, a great number of them were caught. One was the Atlantic Pipe Line, which was found short 6,000 barrels on one occasion.

Q. (By Mr. Kennedy.) Do you know of any such shortages in recent times? A. No; there have been no such shortages. There have been suspected shortages. There have been several gauge movements organized by the oil exchanges to verify the statements of the National Transit Company. There was one very prominent one in 1884, when the stocks amounted to nearly 40,000,000 barrels. An examination of the thousands of tanks in which this oil was stored in various parts of the region proved the correctness of their statement. The report of the gaugers was accepted by the various oil exchanges, and the public mind quieted as to the rumors of shortage.

THE CAPACITY OF THE NATIONAL TRANSIT PIPE LINE.

Q. (By Mr. Phillips.) Have you any knowledge of what it requires to fill the National Transit line, and of the residuum in the bottom of the tanks which would not be called merchantable oil? A. No. My knowledge of that would be hearsay and estimation altogether. I doubt if that experiment has been conducted. There have been estimates based on the capacity of the line.

Q. Would it take three million or four million? A. I have heard it estimated higher than that.

Q. Higher than four million? A. I have heard the quantity required to fill the line estimated at more than four million barrels.

Q. Do you know about how much oil was in the United Pipe Lines when oil took such a sudden advance, about two or three years ago? A. Well, I think the capacity of that line was fully represented in transit.

Q. Do you know about how much oil they had on hand at that time? A. We ought to be able to show it to you.

Q. We should be very much obliged for that information for about April, 1895. A. The amount of the stock in April, 1895, was 4,545,784 barrels.

Q. Do you know how many certificates of the Standard were outstanding at that time. A. I can not tell that.

Q. Do you know the amounts that were on hand at that time belonging to other people? A. I can not state that. Only the monthly pipe line report will show that.

Q. Have you not the pipe line report there for that month? A. I am reading from the stocks. This book runs by shipments.

Q. Does it not show the credit balance for each month? A. I do not think so.

Q. Are not the certificates shown? A. I think not; simply runs, shipments, and stocks.

Q. Well, you stated that you had heard it estimated at between four and five million barrels. Could that and the indifferent oil in the bottom of the tanks be delivered to the purchaser, if there were a purchaser? A. If all production were stopped at a given hour and everything entirely shut off, they would probably not be able to continue operation beyond a day or two at the outside; but the production at this period was upward of 85,000 barrels a day, and that going constantly into the line equaled the shipments required to meet the demands of the trade.

Q. To meet the demands. A. That going into the line constantly, day by day, met the demands of the trade.

SHORTAGES IN PIPE LINES.

Q. Did the Standard own all that went in day by day at that time? A. As I stated before, we have no means of showing that except by the statement published every month. To return to Mr. Kennedy's question, I will say that reports of this kind were not at all infrequent in the days of wildcat pipe lines, but they were not alarming to the trade when made. It was a condition that was met with anywhere, but it shows at the same time that the pipe lines then ran very close to shore. They used oil everywhere they had it and expected to make it up in the future. A report of the Atlantic Pipe Line was posted in Titusville, March 17, and quoted by the Oil City Derrick, March 18, 1876, under the head of "Titusville Doings. Pipe Line Returns." (Reading:)

From our special reporter. Titusville, March 17. The Atlantic Pipe Line, with headquarters at St. Petersburg, and no connection with the associated lines, makes substantially the subjoined report in round numbers. It will be seen that a shortage of 6,000 barrels appears, the actual loss in handling over and above the 2 per cent deducted for this cause by each line in the regions. This, however, is amply covered by the purchase from reliable parties of 15,000 barrels, paid for and ready for delivery when required. Notwithstanding the very large percentage of certificates in proportion to the total stocks, the line is in the most prosperous condition, and by the first of May is expected to be entirely free of debt, with the whole cost of construction fully liquidated. During February the receipts were above the usual average, footing up to 55,000 barrels. The statement for the month is as follows:

Total amount of crude oil in the pipes and tanks of the company, February 29, 1876..	84,045
Total amount of crude oil for which the company was liable on the 29th of February, 1876	90,000
Represented by certificates	78,000
Represented by credit balance	12,000
Purchased from reliable parties and paid for oil to be new from the wells	15,000
Total amount of crude received during the month	55,500

Then follows a line of figures showing that there was an existing shortage at that time of about 6,000 barrels on less than 2,000 barrels a day of business. And that was a very common experience in the days of wildcat pipe lines.

"IMMEDIATE SHIPMENT" EXPLAINED.

Q. (By Mr. Phillips.) Have you anything else to say? A. There are other points of interest upon which the public mind has been befogged that I should like to discuss. The question of premiums has already been discussed. Now there is another one which occurred during the period of the Bradford development that created a great deal of discussion, and that was immediate shipment.

Q. (By Mr. Smyth.) What was that. A. Immediate shipment.

Q. Immediate? A. An order known as "immediate shipment." Oil was produced so rapidly at one period in the Bradford field that the tankage system of all the pipe lines, as well as the private tankage of the country, was insufficient to take care of it; and the clamor to have their oil cared for compelled the pipe lines to issue an order for immediate shipment. That is, they would take oil for immediate shipment and then the purchaser might come into the market owning tankage and having cars to ship his oil to market, and would be able to purchase it at a lower price than the regular prices offered in the oil exchanges. That was called an immediate shipment order. And the point upon which the public mind was befogged at this time, is the supposition that it was the only time when immediate shipment ever went into effect. The first immediate shipment went into effect in the fall of 1872, following the 30-day shut-down, or very close upon the heels of the 30-day shut-down. Epizootic, which was then a new disease among horses in our region, was epidemic, and there was a compulsory shut-down of almost 30 days more following the shut-down by agreement. It was during this period that the Empire Pipe Line established the order of immediate shipment. The field gaugers were instructed by orders from the general office at Parkers Landing what oil to ship and the quantity, regardless of the practice customary at the time; the office directed the quality, the quantity, and the time the oil should be taken, precisely as was done six years later in the Bradford field and also in Butler county.

WHY 2,000,000 BARRELS OF OIL WAS SET APART FOR THE BENEFIT OF LABOR BY THE STANDARD.

Q. (By Mr. Kennedy.) You spoke yesterday about several million barrels if oil having been set apart by the Standard Oil Company and the producers for the benefit of the drillers, I believe? A. For the benefit of the oil well workers, the drillers and tool dressers, etc.

Q. Was that the natural result of a philanthropic impulse on the part of the Standard Oil Company and the Producers, or was it for the purpose of keeping those workers from engaging in work in other fields and developing them? A. Well, I might say that both motives suggested in your question operated. The purpose was to do justice to labor on the one hand, and give it an inducement—

Q. (By Mr. Phillips.) And to have co-operation on the other. A. Yes, for their co-operation.

Q. (By Mr. Kennedy.) There was an idea, though, of keeping them out of the other fields. A. Oh, yes; that was the central idea.

Q. That was the central idea? A. Yes, because the practical men can always obtain the necessary capital where there is any inducement for the drilling of wells.

Q. That, rather than philanthropy, was the motive? A. The idea was to prevent labor engaging in other employment to their detriment. But I will say this for the producers in the oil regions, that labor is nowhere better cared for than it is there, or more loyal to the producers; that is true of both the producers and the Standard. Labor has no kick there.

Q. Are they organized? A. Yes, there is a well drillers' organization. I believe it is in existence, but I do not think they hold meetings very often.

Q. (By Mr. Phillips.) Was it not generally stated that it would be a great injustice to labor to shut down for a period of a year without any compensation, leaving them out of work? A. That was stated; but I will say furthermore that it was the custom in previous shut-downs to take care of labor.

Q. (By Mr. Kennedy.) Your testimony is that the central idea was to keep these men from engaging in the work of developing wells elsewhere. A. Well, if placed upon their own resources without the means of livelihood, nothing would be left but to engage in the first movement that offered. The laborers shared in this entire movement, as a matter of justice to labor, I think, as much as anything else. That is the view that I have always taken.

NUMBER OF MEN AFFECTED AND THEIR WAGES.

Q. (By Mr. Ratchford.) Are we to understand that labor received compensation during the period that it was thrown into idleness by the shut-down? A. They received compensation, yes.

Q. Equal to their wages? A. Well, I shall have to answer that by explanation. The labor in the oil country is for the most part contract labor. While the drillers receive so much per day. the

competition is so great that they are rushed with their work. The aim is to drill a well in as short a period as possible. The interval between wells is often extended, so that it is very difficult to arrive at any estimate of what the drillers' year would be. It might be estimated at 200 days, and wages at the prevailing prices for first-class men at about $1,000 a year.

Q. (By Mr. Phillips.) At that period it was about $3 to $3.50? A. Yes.

Q. And when it closed it was advanced to $4.50? A. An advance took place.

Q. (By Mr. Ratchford.) Are you prepared, to state how much they got, what the average pay offered them was? A. I believe it will appear in the testimony of the secretary of the Well Drillers' Union, in connection with the report of the committee of Congress in 1888. That subject is fully gone into there, and I believe some figures are to be found in that report.

Q. Will you state the number of men involved? A. The number of men, as stated in that report, was, I think, about 2,000. I think it was more than 2,000. The testimony of Henry Webster will throw some light on that question.

Q. (By Mr. Kennedy.) It is so extraordinary for corporations to care for the interest of workmen in this way that I should like to have a better understanding in regard to it. You say that the motive of philanthropy on the part of the Standard and the producers was one consideration, and that keeping the men out of work in other fields was another consideration. I should like to ask you which you consider overbalanced the other, the matter of philanthropy, or the matter of self-interest on the part of the oil interests? A. Inasmuch as it was a business arrangement, I think that the business consideration had a great deal to do with it. It was purely a business consideration, and you might call it a selfish one in that respect and to that extent.

Q. (By Mr. Farquhar.) Have not the parties taken credit for sympathy and philanthropy in granting the terms that they proposed to the drillers? A. Oh, yes; there is some credit taken in that way.

LABOR ORGANIZATION NOT PROMINENT IN THE OIL INDUSTRY.

Q. (By Mr. Kennedy.) Do the Standard Oil Company and the independent companies look with favor upon labor organizations? A. So far as I am informed on the subject, I believe they do, although so far as labor organizations apply to the oil industry, we have very little of it. It is a matter of individual contract, and the wages is dependent usually upon the skill of the operator. For that reason we have very little of the union of labor there. The question of uniting enters less. perhaps, in the oil industry than any other, because all men are not placed exactly upon the same plane. Now, in drilling, you can take a firm employing a dozen drillers, and half a dozen may receive 50 cents a day more than the other half. It is a matter of skill, but when it comes to the operation of lifting oil. the wage is pretty generally uniform on that. The pumpers receive uniformly from $40 to $55 a month.

Q. (By Mr. Clarke.) You have stated that, when there was a curtailment of production, through a cessation of drilling new wells, labor was the one interest which suffered? A. In that connection, yes.

Q. Do you mean the labor that would have otherwise been employed in drilling new wells? A. In drilling new wells.

Q. Or all the labor in the oil industry? A. I mean to say it was the labor employed in drilling 800 fewer wells drilled during the year 1888 than there were the year previous. The labor suffered to the extent of the wage involved in drilling 800 wells.

Q. (By Mr. Phillips.) Less what they received in the sale of the oil? A. In the sale of oil?

. I believe you said yesterday that they received more than the producer did in the way of profit? A. Well, it was my imperssion that they received considerable more; their oil sold at a higher rate; it was sold at different times.

Q. (By Mr. Clarke.) If, then, that curtailment was for the interest of the oil producers, it benefited certain portions of labor as well as injured certain portions? A. It certainly benefited the producers. Labor was benefited equally with the producers, in my opinion, because drilling did not entirely cease, and drillers could get permission from their union to engage in drilling on gas wells and wells outside of the prescribed territory. The prescribed territory was limited to oil produced from the sedimentary rocks—that is, New York, Pennsylvania, Southern Ohio and West Virginia. In the oil produced from the Trenton rock was not included that of Ohio and Indiana. I presume during this period 50 wells a month were drilled in the country at large for gas, furnishing constant employment, four men to a well, for 200 men. I think that is not overestimated.

PRESENT CONDITION OF THE OIL INDUSTRY.

Q. (By Mr. Smyth.) What would you say was the present condition of the oil industry? A. I should say that it was exceedingly satisfactory to the oil producers.

Q. Both to the independents and to the Standard? A. Both to the independents and the Standard; all the interests together are satisfied with existing conditions.

Q. (By Mr. Ratchford.) How is it as compared with some periods that we might name, say, for instance, three or five years ago? A. There was a brief period four or five years ago when it was better. Oil temporarily ran up to $2 a barrel.

Q. You say that was two or three years ago? A. Well, it was equally favorable two years ago.

THE OIL INTERESTS IN COLORADO.

Q. You made a statement yesterday that I should like to have you explain. The statement was, I believe, that were it not for the cost of transportation, oil might be sold by the Standard Oil Company in Denver, Colo., as cheaply as at the initial point of production, or the refinery. A. Yes.

Q. Are you familiar with the oil interests of Colorado and their relation to the Standard? A. Only in a general way.

Q. Are you aware of the Standard in that State? A. No.

Q. The commission has testimony bearing upon that subject to the effect that the producers of Colorado have found it to their advantage to sell all of their crude product to the Standard Oil Company. Do you wish to say anything on that? A. Well, I have notundertsood that the Standard were manufacturing oil in Colorado.

Q. (By Mr. Farquhar.) They are the producers of the manufactured oil? A. I understood them to be the purchasers of the manufactured and the distributors of the oil. I am not familiar with the prices of crude oil in Colorado. The field is so distant that there is no relation between their product and ours. There is no intercourse between the oil fields of the east and those west of the Mississippi River. One does not enter into any consideration with the other, so far as I am aware, and therefore we pay no attention to the product of that region. If it entered into competition with us in the east, we should have reporters there and know all about it, but until it does that there is no occasion to be at the expense of getting reports.

Q. (By Mr. Phillips.) Are they not prohibited, in a sense, from refining oil in the western field? Is not oil confined to fuel products, sold for fuel, and seldom refined? A. I do not know as to that. I am not familiar with the operations west of the Mississippi.

SOURCES OF STATISTICS OFFERED IN EVIDENCE.

Q. (By Mr. Jenks.) I wish to ask one or two questions with reference to the sources of the statistics, etc., that you have submitted, so far as that does not appear on the papers themselves. Have you been actively engaged in the oil business, either as a producer or refiner? A. I am a producer now to a small extent.

Q. How long have you been in the business as a producer? A. In and out of it always.

Q. So that a part of the informaton you have given is your own personal experience? A. My own personal experience and observation.

Q. Have you been associated with any of these different producers' associations of which you have spoken? A. Never with any of them.

Q. You have always been entirely independent? A. I was never a producer to the extent that would entitle me to belong to them, because most of these associations elect their members.

Q. You have not been a refiner of oil at all. A. No.

Q. As regards the statistics we find in this book, from what source, in the main, are they? For example, the report prices come from where? A. They come from the government reports here.

Q. And what is the source of the figures you submitted with reference to the profits of the producers of oil, the amount produced, the price, etc.? A. They are deductions made from the figures given in these reports.

Q. That is, you have taken the official government figures and made your deductions from them? A. No; we get no official figures on crude oil from the government.

Q. The figures you get from the government are on the export oil? A. Yes.

Q. Where do the figures on the crude oil come from? A. From the pipe line statement. Since 1874 the statistics have been posted. Every transportation company is reuired by legislative enactment to post their statements.

Q. Then the information that is given concerning profits is really a deduction based upon these figures of the pipe lines and upon the official prices? A. And upon the official prices; yes.

Q. Have you any other papers whose sources are different from those you have mentioned? A. Different in what respect?

Q. I mean coming from different sources. A. Oh, yes; in arriving at the conclusions here.

Q. At the conclusions you have given in your testimony? A. We have ransacked every source of information—the trade journals and State Geological Survey, the State made an exhaustive research in the early development.

Q. You have cited them? A. These papers were made up from the daily press at the time—the daily publications of eastern cities.

Q. In every case in each of these documents do the sources of information appear? That is the special point I want to get at. A. Oh, we might cite them from the Derrick Handbook. They all come from the Handbook.

Q. So, if the Derrick Handbook is cited we can find the original sources, can we? A. Yes.

Q. And the Handbook itself will tell where you got the figures? A. On crude oil you will get it from the statistics of prices in the daily press, which gives the annual price and the average price.

Q. When you cite the Derrick Handbook, however, that will give us the sources from which the Derrick Handbook got its information? A. Oh, yes; we can furnish the information.

METHODS OF COMPETITION EMPLOYED BY THE STANDARD.

Q. With reference to the question of special cuts made by the Standard Oil Company for the purpose of selling its oil in certain localities, I believe you said yesterday that you had no specific knowledge at all excepting your observation in your im-

mediate locality? A. We have information as to the periods when the cuts were made and the amounts; we know of that; we have all that.

Q. I refer to special cutting of rates to drive out competitors? A. Do you refer to crude oil?

Q. No; refined. A. I have no further information whatever on that. Refined oil enters into our calculations in the oil country to a very small extent.

METHODS OF THE STANDARD'S COMPETITORS.

Q. Have you any specific information with reference to the methods employed by the Standard Oil Company for obstructing the completion of the independent pipe line to the seaboard? A. I never understood that; but I have information on the other side concerning the stopping of operations by the Standard Oil Company. In 1874 the National Transit Company undertook to lay a pipe line from Parkersburg to Macksburg, and they were stopped at several points by Mr. George Rice, who obtained a lease across the track of their right of way; that is, Mr. Rice employed a man to take rights of way across the track of the pipe line, a man by the name of Ogle.

Q. What is the source of your information—Mr. Ogle himself? A. No; I was present. Mr. Ogle first informed me that he was engaged in the work, and he showed me his contract.

Q. With Mr. Rice? A. No, with the farmers; he made contracts with the farmers for getting these exclusive rights. An exorbitant sum was named for this exclusive right, when the pipe line was laid. He had the exclusive right of it, but no consideration passed to him until the work was done.

Q. And he himself informed you that he was doing this work for Mr. Rice? A. Yes; he informed me that he did it in Mr. Rice's name. The work was done in Mr. Rice's name.

Q. The special purpose being to shut off the National Transit Company? A. To shut it off from its destination.

Q. Did Mr. Rice intend to build a pipe line? A. No; not under those contracts. He built a pipe line, but not under those contracts.

Q. (By Mr. Kennedy.) Did Mr. Rice succeed in preventing the building of that pipe line? A. No; the line was laid; Mr. Rice was outbid. That is the only case that has come under my observation.

Q. (By Mr. Jenks.) It has been stated here that the Standard has sold different grades of oil at the same price. Have you any knowledge of the methods of the Standard in selling refined oil. A. No; that would come within the domestic trade department; it does not enter into our business at all.

INVENTIONS AND IMPROVEMENTS IN PRODUCTION.

Q. You mentioned a number of very valuable inventions that have been made in developing the oil regions. A. Yes.

Q. In your judgment, have the most important improvements been made by men working with the Standard or the independents? A. Well, so far as the Standard and the independents are concerned, neither has a monopoly on genius. Everybody buys from inventors wherever they can. The Standard is undoubtedly entitled to more credit than it has received for its achievements in refining Lima oil.

Q. The chief movements along that line have come from the Standard A. They have come from the Standard in the manufacture of Lima oil.

Q. (By Mr. Phillips.) Did not George Van Vleck and some others make very good oil? A. I am very glad you asked that question; their process was not a new one; it was a very old one.

Q. It was not used by the Standard prior to that time? A. No; it was used by other people. Allow me to explain that the process of Van Vleck was applied by some professor in Buffalo. That metallic oxide process has been used by gas men in the purification of gas ever since the manufacture of gas began; but as early as 1861 Homer T. Yaryan used that same process in the manufacture of Canadian oil. The Standard's process is very different from that and far more successful.

Q. That enters largely into it, does it not? A. Oh, yes; those appliances enter into it very largely.

NO KNOWLEDGE OF RECENT RAILROAD DISCRIMINATION.

Q. (By Mr. Jenks.) Statements have been made concerning the railroad discriminations is favor of the Standard Oil Company in the early days. You have yourself made some statements of the kind. Have you any knowledge of discrimination in freight rates, say, within the last 15 years? A. No; but I have some records here to show where railroads went into contracts with pipe lines to furnish them rebates of 10 cents a barrel on all oil shipped except shipments on a certain line.

Q. Within what period? A. Oh, that was 30 years ago.

Q. You have matters of record of that kind in general? A. Yes.

Q. Have you any instances different from those brought out before the Congressional committee? A. All I have is the averments of the Pennsylvania Transportation Company in its litigation with the Oil Creek Railroad.

Q. You have not anything in that line within the last 10 years? A. No.

Q. In your judgment have there been any special discriminations made in favor of the Standard Oil Company, or in favor of the independent refiners, particularly within the last 10 years? A. I am told there is not; I do not know anything about it. I am told there are no discriminations anywhere.

THE STANDARD OIL COMPANY AND THE NEWSPAPERS.

Q. You have heard the charge, of course, that the Standard Oil Company has at different times used its influence with the press to further its own interests, by having special articles put in as editorials, for example, that were paid for as advertisements and matters of that kind. Have you any

knowledge on that subject? A. Yes; I have some knowledge of such a business arrangement with certain newspapers in Pittsburg.

Q. Can you give us some information? A. Only concerning existing contracts for advertising their products. The Standard has at various times been viciously attacked by persons associated with the Producers' Association, and they have replied, and the replies have been paid for while the attacks were received free.

Q. By what papers? A. By all of them. Not one of them will receive a line from the Standard Oil Company except at advertising rates. I do not know of a single newspaper in Pittsburg that will receive a line in contradiction of the most outrageous and infamous lies.

Q You mean to say, if I understand you, that the Standard instead of buying up the papers is practically blackmailed? A. I have not said so; no.

Q. You did not intend to make any charge? A. No; but I make this assertion: The Standard does not receive the same courtesy from the press that other corporations and individuals do.

Q. With respect to your own paper—it is, perhaps a fair question—does the Standard receive the same courtesies that the other producers do, the other oil interests? A. Exactly the same. I have rendered a bill to no man for a courtesy since my connection with it.

Q. Both parties are treated the same? A. Both parties have been treated alike.

WITNESS PROSECUTED FOR LIBEL.

Q. Have you been attacked legally in your paper? A. Oh, yes.

Q. Can you give us some account of that? A. Some little account, I guess. [Witness produces bulky package of papers.]

Q. You can , perhaps, state the substance of that and put in the exhibits. [Laughter.]

Mr. Smyth: No; let us have the whole thing.

A. I have a great many records here, gentlemen.

Q. (By Mr. Phillips.) Court records? A. Yes; they are all court records.

Q. (By Mr. Jenks.) Can you make a brief statement as to the legal proceedings? A. If you ask me a particular uestion concerning any particular suit, at a given time, I can, but to go into the general question——

Q. How many suits have you had for libel? A. Oh, half a dozen, I suppose. All by the same persons and the same influences.

Q. Who were those persons? A. Well, the officers and members of the Producers' Protective Association.

Q. What has been the result of those suits? A. Conviction was obtained in two of them, in two others there was a confession of judgment, and in one other a failure to convict. Those suits were all taken into a foreign county where their own element was the strongest, where prejudice was the greatest. I do not think anything more infamous was ever practiced on the press since the first newspaper was published than the proceedings of these men who call themselves gentlemen in trying to muzzle the press by dragging it before hostile courts and juries. They did not possess the decency to give me a trial at home in my own courts where I could stand up with my neighbors and be judged by them according to my own merits. The very judge in one instance who attempted conviction was a partner of at least two of the men who brought suits, and yet he had the hardihood to sit there in judgment, just filled with prejudice, poisoned with it.

Q. (By Mr. Phillips.) Will you name that judge? A. No; I do not care to name that judge. No; I will not name anybody in connection with these suits, except where it is becomes necessary.

Q. You can perhaps give us a citation of the cases? A. I have not the citations here. Senator Lee, in his capacity as president or director or officer of one of these companies, sued me for some expressions in my newspaper. In that case there was a confession of judgment. A. D. Wood, an officer, treasurer of all these companies, sued me for expressions in the newspapers, and on the first trial of that case before a hostile court and before a packed jury, I was convicted, but obtained a new trial on the judge's charge. Upon the second trial there was a failure to convict.

STANDARD OIL COMPANY A BENEFIT TO THE COUNTRY.

Q. (By Mr. Smyth.) Are we to understand from your testimony that you do not consider the existence of the Standard Oil Company detrimental to the development of the oil industry in Pennsylvani, Ohio, and other States? A. It certainly has not been; it has been very beneficial to the industry as a whole; the organization effected by the Standard Oil Company could not be duplicated in the whole world.

Q. Do you consider the existence of the Standard Oil Company to be a marked benefit to the American people? A. It has been a very great benefit in the development of an industry that requires organizing capacity and great mercantile ability. I give them no credit for manufacturng. Others manufacture just as cheaply and as well; but where others fail is in their organizing ability and their mercantile capacity. The Standard Oil Company are the greatest merchants on earth.

Q. Do you not consider the Standard Oil Company a trust? A. Not now.

Q. Why not now? A. The trust has been dissolved and the companies have gotten back into their original positions. The trust agreement under which they operated prior to 1892 has been dissolved and a number have returned to their individual organizations and are operated as separate concerns.

Q. Is there any trust in existence now in kerosene oil? A. The Pure Oil Trust is a step in that direction, not wholly accomplished, but then it is hoped to be accomplished.

Q. That is the company you were talking about before? A. Yes.

THE STANDARD OIL COMPANY HAS MANY COMPETITORS.

Q. That is the only organization in opposition to the Standard Oil Company? A. Oh, no; there are several. There are a great many companies in opposition to the Standard Oil Company, but it is the only one that copies the Standard's organization from beginning to end, even to the trust. After the Standard relinquished the last, the Producers' Protective Association picked it up where they left off and are attempting to carry it out, under various nom de plumes and pretenses and fictions of law, just what the Standard did in a public, open way.

Q. I understood you to say that the Standard Oil Company controlled about 80 per cent of the output? A. Well, I should think that would be a very liberal estimate for them.

Q. The other 20 per cent is controlled by how many companies? A. I should think 50 or 60.

Q. Fifty or sixty? A. Yes.

Q. Independent and selling their produces? A. Yes.

Q. Both in this country and abroad? A. Yes.

Q. Have they rivals in selling their oil for export? A. Well, the Pure Oil Company is selling in rivalry.

Q. Any others? A. I am not familiar with that branch of the business.

WHY THE STANDARD IS SUPERIOR TO OTHER CONCERNS.

Q. You think the great profits of the Standard Oil Company have come from its superior organization? A. That states the case precisely; from their great mercantile ability, their commercial ability.

Q. In other words, in putting their oil on the market they have hired the best brains they could find? A. Yes; they have experience of their own to start with, and they keep adding to their mental talent right along.

Q. (By Mr. Phillips.) Do you not think, if the oil fields had been opened to competitors without monopoly and without discrimination, that talent equal to what is exhibited by the Standard now would have been developed? Do you not believe that the difficulty with the region was too much competition—over-competition? A. Competition, in fact, resulted in what the Standard has accomplished; it was a weeding out, a survival of the fittest, that made the Standard. Darwin's theory of the survival of the fittest was never better illustrated than in the organization of the Standard Oil Company; it represents the best element in all branches of the trade.

Q. Since it was organized have they kept the best element or have they proscribed men of equal ability by their methods? A. Well, there are men in the oil business who have superior abilities to any man in the Standard Oil Company for certain purposes. There are men who can beat them in producing; but your question leads to but one answer: What they have done answers you. What you ask has been done by the Standard Oil Company. If there were others who could do that, the only reply is others did not. It is a case of Columbus and the egg over again. Lots of people could sail the ocean now, but only Columbus sailed in 1492.

Q. Now, do you want to inform this commission that twenty years ago the fittest got together and that there would not have been competition equal in ability if it had not been for the monopoly of pipe lines and rates? A. Can you tell me why the others did not go in together? That is the best answer to your question; if you can tell me why they did not get together I will answer your question.

Q. Before the free pipe line law was passed did they have an opportunity to get together? A. Exactly the same opportunity that the Standard had.

Q. I mean after they got to the seaboard? A. I am stating why they did not before that time when the region was in a state of chaos. Transportation was in a topsy-turvey condition, the Standard came in with three millions of capital and organized one pipe line that did the business of fifteen or twenty. That was all that was represented in the transportation department at that time.

Q. (By Mr. Symth.) Was there any risk—was it considered experimental in any sense? A. It was considered a very great risk.

Q. Was the risk such that other people did not go in? A. That was the very reason why other people did not go in, the amount of money required, and the risk involved.

Q. The Standard Oil Company has blazed the way there? A. They blazed the way; they had energy and courage and ability.

Q. (By Mr. Phillips.) Did they start the pipe line system, which has become the mode of transporting oil? A. They merely developed it; others started it.

Q. And when others got there they controlled the line to the seaboard and control it now and limit its output? A. Oh, yes; they do it, but that is merely an incident in the business. It cuts no figure; it is a source of vexation even to its stockholders; they are not agreed in the matter of policy.

THE STANDARD AS A PRODUCER OF CRUDE OIL.

Q (By Mr. A. L. Harris.) I wish to know what per cent of the 80 per cent which the Standard Oil Company consumes in refining is produced by it? A. Well, in Pennsylvania, I think 25 per cent is conceded to them.

Q. Where do they get the other 75 per cent? A. By purchase from the producers.

Q. In the market from the producers? A. In the market from the producers.

Q. Is the price satisfactory to the producers? A. It seems to be satisfactory. There is no complaint now on the question of price; the price is higher now than it has been for a year or two.

Q. They are open competitors with others? A. Oh, yes; there are other buyers in the field.

Q. (By Mr. Phillips.) What part of Ohio do they

control; that is, the crude oil of Ohio? A. What proportion?

Q. What proportion, about, in Ohio? A. Well, I should think it would be 50 per cent, at least.

Q. They control therefore much more of the Ohio field than they do of the Pennsylvania and West Virginia fields? A. The Ohio oil does not come in competition to a very great extent with West Virginia.

Q. You stated a moment ago that the original trust had been dissolved. Have they reorganized under the New Jersey laws recently? A. I believe they are in process of reorganization; that is the opinion at the present time.

Q. At the present time where do they get their corporate powers? A. From the individual companies.

Q. Organized in different States? A. Organized in different States for different purposes and with different managers.

PRICE OF CRUDE OIL NOT CONTROLLED BY THE STANDARD.

Q (By Mr. Smyth.) You do not agree, then, that the Standard Oil Company controls the price of crude petroleum? A. No.

Q. Have they any means of controlling prices and forcing producers to sell? A. The only means to force the producers is by increasing the price.

Q. Paying over what seems to be the market value? A. Paying over what seems to be the market value at the time.

Q. Do you believe that has been done? A. It has been done.

Q. They buy crude oil in the open market? A. Yes.

Q. (By Mr. Phillips.) Is there any purchaser of crude oil in the Standard lines today excepting the Standard themselves? A. Well, I can not answer that question; I am not familiar with the Standard's business; I do not know from whom they buy or to whom they sell. In a general way, I know they buy all the oil offered to them, but I do not know to whom it is sold.

THE PRODUCERS OF CRUDE OIL ARE PROSPEROUS.

Q. (By Mr. Smyth.) Is there any complaint from the producers of crude oil of lack of buyers? A. No; none whatever.

Q. Are they making money today? A. The producers are prosperous today.

Q. Are they satisfied with the price they are getting? A. They are satisfied with the price so far as we have observed.

Q. Then the fact is the Standard is the only buyer and you maintain they are paying a fair, legitimate price for the oil? A. I think they pay all it will bear, and that condition has existed since 1895, as I have submitted the figures to show.

Q. Since the Standard Oil Company is the only buyer, what would become of the product if they did not buy? A. It would mean failure.

Q. Insolvents by hundreds? A. On every hand.

Q. Great want? A. Great want would undoubtedly result from it.

THE STANDARD HAS MADE THE OIL INDUSTRY WHAT IT IS.

Q. You want this commission to understand that in your judgment the Standard Oil Company has been a large factor in developing the oil business, and that without the Standard it could not have attained the present enormous proportions? A. I do not wish to be understood as saying anything different. But for the Standard Oil Company you would not have the oil business that exists today.

Q. It would be on a smaller scale, with competition such as existed thirty years ago.

Q. (By Mr. Phillips.) Was not that in its infancy? If one railroad had control of all the business they could bring disaster and ruin by stopping? A. I do not know what you call infancy in a business twenty years old.

Q. The pipe line business did not come into existence for quite a number of years after the discovery of oil, as explained yesterday? A. The pipe line business cuts a very small figure in the general success of the Standard Oil Company; it is only one of the lines upon which it has been successful.

Q. Could it exist without the pipe line system? A. Oh, no; but it is only one of the means of their success. Their great success is due to their capacity to find markets.

Q. Is not the transportation the principal factor in their great success? A. I do not know that it is. I am not going to split hairs and express an opinion on that ground. The principal result is that today the business is greater than any other business in any country. It is due to the organization of capital and the intellect and industry of the persons who manage it .

Q. (By Mr. Smyth.) You think brains come in there too? A. Brains come in more than anything else. That is what I mean to say. The Standard Oil Company was unknown when the pipe lines were organized; they came as strangers into the business.

WASHINGTON, D. C., September 3, 1899.

TESTIMONY OF B. A. MATHEWS.

At a meeting of the Industrial Commission, held at its offices in the Bliss building, on September 8, Vice President Phillips presiding, Mr. B. A. Mathews appeared at 2:45 p. m., and, after being duly sworn, testified concerning the oil industry:

Q. (By Mr. Jenks.) Kindly state your name and address. A. B. A. Mathews, Columbus, Ohio.

Q. What business are you engaged in? A. I have charge of the marketing of the products of the Standard Oil Company in a portion of Ohio.

Q. What is the official statement of your position? A. I bear no official title.

Q. General manager for the State of Ohio, you are ordinarily called? A. I am what is generally understood as a manager, but bear no title.

Q. How long have you been in the position you now hold? A. I have been in Columbus about six years.

Q. Have you been in your present position, managing the business, for that time? A. I have been managing the business for central and southern Ohio for six years. I have been engaged as manager in other departments previous to that.

Q. I understood you had some statement to make with reference to certain statements that Mr. Clark made regarding your actions with him and the business. You may make that statement as you please.

CONNECTION OF W. H. CLARK WITH THE STANDARD OIL COMPANY.

The witness, Mr. W. H. Clark, of Newark, Ohio, who has given testimony before this commission, was hired, when a youth, to work at Marietta as office and warehouse boy, at a salary of $15 per month to learn the business, and as fast as he became proficient in the work was promoted in salary and position, until he became local agent at Newark, at a salary of $2.25 per day. While at Newark he became short in his accounts, was discovered and discharged, which is the only incentive that I can discover for the series of untrue and malicious statements made by him before the commission.

I have looked over his testimony carefully and desire to answer his statements seriatim.

THE "FARMER STORY"—TESTIMONY OF WILLIAM EBRIGHT.

His statements about competition and variation in prices at Marietta are untrue. His position of office and warehouse boy did not bring him in contact with the trade; he could not be informed; therefore would know nothing about methods of marketing oil or prices. Davis, the peddler referred to, has never been in the employ of the company, and the "farmer story" has been refuted by Mr. Ebright. I have a certified transcript of his testimony, which I submit.

EXHIBIT 1.

Certified transcript of portions of testimony of William Ebright, selected by B. A. Mathews, taken in the case of the State of Ohio, ex. rel. F. S. Monnett, vs. the Standard Oil Company.

Q. Didn't you play the farmer there? A. No, sir.

Q. Didn't you have a barrel and a wagon and play the farmer? A. I had a barrel and got a wagon until I got my cans.

Q. Didn't you sell the oil as an independent dealer—as a farmer? A. No, sir.

Q. What were your instructions about selling oil? Where were you to sell? A. I was to sell to everybody I could.

Q. Were you not to cut the prices? A. There was no cut in the prices; they were the same.

Q. Was you not there to run out Curtiss, the colored man? A. No, sir.

Q. When you drove him to buying oil of the Standard Oil Company, then you left? A. No, sir; the wagon was still there—I sold out to another man.

Q. That was after Curtiss went to buying from the Standard Oil Company? A. I don't know this man.

Q. You knew after you got there who you was running out? A. I didn't see that I was running out anybody.

I hereby certify that the above is a true and correct copy of portions of the testimony of William Ebright, selected by B. A. Mathews, taken before me, the undersigned, in the case of the State of Ohio, ex. rel. F. S. Monnett, vs. the Standard Oil Company.

[Seal.] L. R. PUGH, Notary Public.

UNTRUE THAT EIGHT GRADES OF OIL ARE DRAWN FROM TWO TANKS—THE FACTS.

His statement that we market eight grades of oil at eight different prices from two storage tanks at Marietta, and that the manager (meaning me) gave him such instructions, are false. Not being agent, no instructions would be given him concerning prices. The facts are, we have three grades of oil at Marietta and eight names—Ohio State Test and Prime White are two names for the same grade of oil, both sold at the same price. Ohio State Test is a brand adopted by some of the trade when Ohio passed its inspection law, while others adhered to the previously well-known trade name, Prime White, thus creating two brands for the same oil. Water White, Red Star Water White, Silver Light, and Crystal, are four names for the same grade of oil, and are sold at the same price. These four brands are trade names, having been established by custom in different localities to meet the requirements of the local demands. Eocene and Hyperion are not the same oil, but are two different grades of oil; Eocene being manufactured in Cleveland and Hyperion at Parkersburg, the Eocene being sold at one-half cent per gallon above the price of Hyperion and kept in storage at Marietta, while Hyperion is shipped direct to the trade from Parkersburg refinery. There are a few points near Marietta where it pays better on account of saving in freight to give the buyer Eocene (a better oil) under the Hyperion brand, rather than make the shipment of Hyperion from Parkersburg at a lower cost for the oil. Water White was furnished to one of the jobbers at Marietta under the brand of "Crystal Oil," and sold to him at the Water White market, and was his trade-mark brand.

UNTRUE THAT THE WITNESS ADULTERATED TURPENTINE WITH GASOLINE.

His statement about mixing gasoline with turpentine is absolutely false and malicious. Instructions to all my people have been to give the purchaser what he buys, both in quality and quantity. The officers of the

company have always impressed me with the importance of this principle; further, a buyer can determine adulteration of turpentine with gasoline instantly by the use of an ordinary hydrometer, which all druggists keep. The falsity of Clark's statement about the alleged "trick" I taught him is emphasized by the position he held of warehouse and office boy, the agent being the only one who received instructions. I have the affidavit of W. A. Reed, local agent at Marietta at the time Clark was there, which I submit, marked Exhibit 2. Mr. Reed is not in our employ at the present time.

EXHIBIT 2.

THE STATE OF OHIO, WASHINGTON COUNTY, SS:

W. A. Reed, of lawful age, being duly sworn, upon his oath says:

I was local agent for the Standard Oil Company of Ohio, at Marietta, during the entire time that W. H. Clark worked there. He was an office and warehouse boy, and not in a position to know how the business was carried on.

Referring to the testimony of Clark before the Industrial Commission, given in Washington on June 8, 1899, I would state that it is not true that Mr. Frank Davis was ever in the employment of the Standard Oil Company. Davis wished to go into the oil-peddling business, and we sold him a wagon. We sold Davis his oil outright at the ruling market prices, and he sold it at retail in competition with other peddlers and retail grocers at Marietta, and at the prices fixed by himself, the Standard Oil Company having nothing whatever to do with regulating his or the retail price. Davis continued this business until his death, when his father sold the wagon to a man named Twiggs, who soon after sold it to the Producers' Refining Company, which ran the wagon until it discontinued business.

Curtiss was also a peddler, buying and selling oil in the same way at Marietta. It is not true that he purchased his supplies from the Argand Refining Company. He bought his supplies from the Producers' and the Rice companies until those companies shut down, after which time he purchased his oil from the Standard Oil Company.

It is not true that we played the farmer or any other racket with Mr. Ebright. Ebright was another peddler, who bought and paid me for his oil supplies the same as any other peddler, and sold the oil thus purchased at retail in Marietta.

I had nothing whatever to do with retail prices of oil in Marietta, which were regulated entirely by the competition between the peddlers and the retail grocers of that city.

The statement is absolutely false that we sold oil from the same tank at different prices, representing it to be of different grades, or that we mixed gasoline with turpentine, or practiced any deception of any kind whatever with regard to the quality of our products in selling the same. W. A. REED.

Subscribed and sworn to by said W. A. Reed before me, this 31st day of August, 1899.

[Seal.] FRANK PANHORST,
Notary Public, Washington County, Ohio.

STATEMENTS AS TO DECEPTION OF CUSTOMERS.

His statements about instructions given George Blazer, and cause of his leaving Springfield, are malicious falsehoods. I have the affidavit of Mr. Foley and Mr. Foutz, which I submit, marked Exhibits 3 and 4. Mr. Foley was the local agent at the time Mr. Clark was there, and he is still the local agent at Springfield.

EXHIBIT 3.

THE STATE OF OHIO, CLARK COUNTY, SS:

C. W. Foley, of lawful age, being duly sworn, upon his oath says:

I am local agent of the Standard Oil Company at Springfield, Ohio, and was while W. H. Clark was employed there. It is not true that I ever had any conversation with Mr. Cragin, who is now dead, or anyone else with reference to informing Blazer or any other person about drawing different grades of oil from the same tank and charging different prices for it. It is not true that we ever sold any oil at this station in that manner. All our grades of oil were sold for precisely what they were, and no deception of any kind was practiced upon our customers as to the quality or price of the oil furnished them. It is not true that Blazer quit the employment of the company because he was required by that employment to deceive customers as to the quality or price of the oil sold. The only reason given by Mr. Blazer when he quit was that the work was too hard for him.

C. W. FOLEY.

Subscribed and sworn to by said C. W. Foley before me, this 29th day of August, 1899.

[Seal.] W. H. HOMER,
Notary Public, Clark County, Ohio.

EXHIBIT 4.

THE STATE OF OHIO, WASHINGTON COUNTY, SS:

R. A. Fouts, of lawful age, being duly sworn, upon his oath says:

I reside in Marietta, Ohio, and went to Springfield and had an interview with George Blazer. He stated that he resided at Springfield, Ohio, and worked for a short time for the Standard Oil Company while W. H. Clark was there. He stated that he never said to Mr. Clark or anyone else that if he could not work for an honest company he would quit, and for that reason must leave the Standard Oil Company's employment; or that he was leaving or had left the Standard Oil Company's employment because he could not conscientiously draw different grades of oil from the same tank. He also stated he left the employment of the Standard Oil Company because he did not like the tank-wagon work, and for no other reason. He made

the above statement to me, but declined to make affidavit. R. A. FOUTS.

Subscribed and sworn to before me this 4th day of September, 1899.

[Seal.] O. C. MIDDLESWART,
Notary Public, Washington County, Ohio.

His statement that we drew four different grades of oil out of the same tank, and charged four different prices, is absolutely false. Mr. Clark, as well as all other tank-wagon drivers, was not allowed to discriminate between one buyer and another, but was to charge all customers the same price for the same grade of oil. The proof of this: In making his returns at night to the cashier his total sales had to be accounted for on the basis of the ruling market. Therefore he could not cut the price to any buyer without paying it out of his own pocket, and it goes without saying that no retailer would pay more than the market. I have the affidavits of Mr. Toland and Mr. McMahon, both tank-wagon drivers at the time Clark was at Springfield, the only two men who were doing the same kind of work that Clark did at Springfield, showing their method of conducting the business, which I submit, marked Exhibits 5 and 6.

EXHIBIT 5.

THE STATE OF OHIO, LAWRENCE COUNTY, SS:

W. W. McMahon, of lawful age, being duly sworn, upon his oath says:

I worked for the Standard Oil Company as tank-wagon driver at Springfield during the time that W. H. Clark worked there as tank-wagon driver.

I never had any instructions from Mr. B. A. Mathews, manager, C. W. Foley, local agent, Mr. Cragin, or anyone else connected with the Standard Oil Company, to deceive any customers by turning the faucet in different directions to draw different grades of oil out of the same tank.

All of our grades of oil were sold for precisely what they were, and no deception of any kind was practiced upon our customers as to quality or price of oil furnished them, and all customers paid me the same price for the same grade of oil.

W. W. MCMAHON,

Subscribed and sworn to by said W. W. McMahon before me, this 31st day of August, 1899.

[Seal.] W. D. HENRY, Notary Public.

EXHIBIT 6.

THE STATE OF OHIO, CLARK COUNTY, SS:

C. M. Toland, of lawful age, being duly sworn, upon his oath says:

I am now and was in the employ of the Standard Oil Company as tank-wagon driver at the time W. H. Clark worked as tank-wagon driver for the Standard Oil Company at Springfield, Ohio.

In accordance with instructions received from B. A. Mathews, manager, my prices have always been uniform, selling one grade of oil at the same price to all dealers, and I have never deceived my customers by turning the faucet in different ways in order to draw different grades of oil from the same tank.

C. M. TOLAND.

Subscribed and sworn to by said C. M. Toland before me, this 29th day of August, 1899.

[Seal.] GEO. S. DIAL, Clark County, Ohio.

REBATES—HOURS OF LABOR.

His statement with reference to rebates at Springfield is untrue. We did not allow Mr. Clark, while at Springfield, to make rebates.

His statement concerning hours of labor is misleading and untrue. Our tank-wagon work is planned with the view of a day's work constituting ten hours. In making drives to country towns, from 8 to 14 miles, it is understood that when a driver returns his day's work is completed.

QUALITY NOT DETERMINED BY FIRE TEST.

His statements about fire test governing the quality of oils are not true. One hundred and twenty degrees of fire test, by Ohio law, is the equivalent of 150° by the Tagliabue open cup. Concerning our three grades there is no difference in the fire test of the same. His statement that there is 10° difference is false. They are all 150° fire test by the Tagliabue open cup, or 120° fire test by the Ohio State test Foster cup, which is the State test required by Ohio.

The fire test of oil required by Ohio statutes does not represent quality, but simply safety. Oil may be exactly the same fire test, but different in illuminating power. The quality of an oil is distinguished by its illuminating quality.

His statement that he was promoted to the position of cashier at Columbus and had charge of the work around warehouse is false and absurd, for the reason that his position was simply shipping clerk, under a superintendent, who had entire charge of everything around the works.

BOILED LINSEED OIL NOT ADULTERATED.

His statement concerning boiled linseed oil is false and malicious. The dryer used in boiling was a pure linseed oil dryer, which cost 10 cents per gallon more than linseed oil, and increased the cost, instead of decreasing it, and improved the quality, instead of adulterating it, as testified by Clark.

MINER'S OIL; ITS COMPOSITION—LUBRICATING OIL.

His statement that a miner's oil is made by compounding cotton-seed oil with 40 per cent petroleum is false and malicious, because the Ohio law prohibits such a large per centage of petroleum being used. The law is rigidly enforced on gravity and smoke qualifications, which would absolutely prevent more than 14 per cent of petroleum. Miner's oil is known to the Ohio State officials to be cotton-seed oil compounded with petroleum. The price of miner's oil is regulated by the price of cotton-seed

oil, and runs about two cents per gallon below. It was malicious for Clark to state that a dealer would pay 34 cents for miner's oil, when the dealer could buy cotton-seed oil for 24 cents.

His statement that lubricating oil is received in blank heads at Columbus and shipped out to meet the requirements of the trade without regard to contents is untrue and absurd, because if the barrels came unbranded it would be impossible for the warehouse man to tell the contents, and an order for cylinder oil might be filled with a barrel of sewing machine oil, or vice versa, if Clark's statement were true. I have the affidavit of Adam Paulus, referred to by Clark as "mixer," which I submit. (See Exhibit 7.)

EXHIBIT 7.

THE STATE OF OHIO, FRANKLIN COUNTY, SS:

Adam Paulus, of lawful age, being duly sworn, upon his oath says:

I am in the employment of the Standard Oil Company of Ohio, and am the person referred to in the testimony of W. H. Clark before the Industrial Commission at Washington. While Mr. Clark was employed at Columbus I did the mixing of linseed and cotton-seed oils.

It is not true that our lubricating oils came from Cleveland in blank heads, but all barrels were branded to designate the contents of the package. In preparing boiled linseed oil it is not true that we used a cheap japan dryer, but we did use a pure linseed oil dryer, which improved the quality of the linseed oil. Heated the oil to 225° instead of 125°, as stated by him.

In compounding miner's oil it is not true that we used three barrels of cotton-seed oil to two barrels of miners' stock, being a percentage of 40 per cent of the latter. We only used one barrel of miners' stock to six barrels of cotton-seed, or about 14 per cent.

It is not true that Mr. Clark had charge of the stock from which these compounds were made, or that I had to go to him to get it. The warehouse and stock were in charge of a superintendent, from whom I received my instructions. The stock I got out myself, as directed by the superintendent.

Adam Paulus.

Subscribed and sworn to by said Adam Paulus before me this 29th day of August, 1889.

[Seal.] W. A. Marsh.
Notary Public, Franklin county, Ohio.

CUT PRICES AND REBATES.

In reference to his statement concerning cut prices and rebates at Columbus, as he was only a shipping clerk (and absolutely without knowledge regarding marketing matters), his statements are purely malicious. On the general question of competition we always seek to protect our trade, and when any competitor makes a cut price for the purpose of taking our business away from us (quality considered) we do not hesitate to meet it.

DAILY DELIVERIES FROM TANK WAGONS.

The statement that Mr. Gradwohl took in as high as $200 a day with his tank wagon is untrue.

The largest delivery made by any tank wagon is about $100 per day, and would not average over $50 per day. To deliver 3,000 gallons, or $200 worth, a day would average one five-gallon bucket every minute, ten hours per day, which would be a physical impossibility. I have Mr. Gradwohl's affidavit, which I submit. (See Exhibit 8.)

EXHIBIT 8.

THE STATE OF OHIO, FRANKLIN COUNTY, SS:

Moses K. Gradwohl, of lawful age, being duly sworn, upon his oath says: I am a tank wagon driver in the employ of the Standard Oil Company at Columbus, Ohio, and was there at the time Mr. Clark was shipping clerk, and am the "Mose Gradwohl" referred to in his testimony before the Industrial Commission at Washington. It is not true that I ever took in $200 a day from my wagon. The largest delivery I ever made was about $100, and my average daily deliveries about $50.

Moses K. Gradwohl.

Subscribed and sworn to by said Moses K. Gradwohl before me this 30th day of August, 1899.

[Seal.] Charles S. M. Thrumm,
Notary Public, Franklin county, Ohio.

STATEMENTS AS TO ARRANGEMENT WITH COMPETITORS AT COLUMBUS, COMPETITIVE BRANDS, AND PRICES OF EMPTY BARRELS.

His statement with reference to having an arrangement with competitors to advance markets at Columbus is false. Strong competition still exists, which in itself contradicts his statement. He had no knowledge on the subject, being only a shipping clerk at the works, located a mile and a half away. Therefore he would know nothing of what was going on in the office.

His statement naming competitive brands of oil at Columbus is untrue, their brands being Ohio State Test, Prime White, People's Headlight, Suncene, Water White, and Diamond Light—not Penoline, Safety Light, and Electric Light, as stated by him. Oho State Test, Prime White, and People's Headlight cover one grade of oil; Suncene and Water White, another; Diamond Light a third showing clearly their trade requirements.

His statement concerning the hiring of a boy to watch tank cars and being paid by him are false.

His statement that we took empty barrels at an exorbitant price to hold trade on oil is false. He had nothing to do with the purchasing or handling of empty barrels, and had no knowledge whatever about empty barrel prices. Our price at Columbus is strictly uniform on empty barrels to all customers.

His statement that he was manager at Urbana is

untrue. His position was simply local agent, three-quarters of his time being occupied in driving a tank wagon. He did not have full charge of all the business as stated.

THE CASE OF WILLIAM HELMICK.

His statement about William Helmick, at Urbana is untrue. Mr. Helmick bought only one carload of competitive oil, and after he had sold about half the car he became satisfied that he would lose money on account of leakage and poor quality. We helped him out by purchasing the other half of the car, and he discontinued jobbing oil, but remained in the oil business as a peddler for about two years thereafter. We did not at any time drop the price while he was in business. On the contrary, what little oil Helmick marketed was sold by him at a cut price. No threats were made by Mr. Hollingsworth or Mr. Welsh as stated by Clark. I have their affidavits, which I submit, and also the affidavit of W. H. Hurley.

EXHIBIT 9.

THE STATE OF IOWA, LOUISA COUNTY, SS:

H. S. Hollingsworth, of lawful age, being duly sworn, upon his oath, says:

I am in the employ of the Standard Oil Company, at Columbus, and have been for several years. It is not true, as stated by W. H. Clark in his testimony before the Industrial Commission at Washington, that I ever made any threats of any kind to William Helmick, either alone or in company with Mr. Welsh and Mr. Clark, or either of them.

H. S. Hollingsworth.

Subscribed and sworn to by said H. S. Hollingsworth before me, this 30th day of August, 1889.

[Seal.] W. H. Hurley, Notary Public.

EXHIBIT 10.

THE STATE OF OHIO, CHAMPAIGN COUNTY, SS:

William Welsh, of lawful age, being duly sworn, upon his oath says:

I am agent of the Standard Oil Company of Ohio at Urbana, and am the person referred to in the testimony of W. H. Clark before the Industrial Commission as a cooper man from Springfield, Ohio, where I did formerly work for the company in the cooper shop.

It is not true that I ever made any threats of any kind to William Helmick, of Urbana, Ohio, either alone or in company with Mr. Hollingsworth, or Mr. Clark, or either of them, but the statement of Mr. Clark in that respect is absolutely false.

William Welsh.

Subscribed and sworn to by said William Welsh befor me, this 28th day of August, 1899.

[Seal.] W. M. Rock,

Notary Public, Champaign county, Ohio.

EXHIBIT 11.

THE STATE OF IOWA, LOUISA COUNTY, SS:

I, W. H. Hurley, a resident of Wapello, Louisa county, Iowa, on oath state that I am a notary public in and for Louisa county, Iowa, and at the instance of H. S. Hollingsworth did request one William Helmick to make a deposition in regard to his relations and transactions with the Standard Oil Company of Ohio, at Urbana, Ohio. He was shown a copy of the testimony given by W. H. Clark before the Industrial Commission at Washington, D. C. He declared that the testimony, as shown him, in reference to himself was false and untrue, and particularly referred to the causes as therein set forth in regard to his going to the poorhouse, and that it was not brought about through any agency of the Standard Oil Company, but declined to make affidavit as to falsity until he had communicated with the above referred to W. H. Clark. I state further that he made the above statement in the presence of myself and H. S. Hollingsworth.

The copy of testimony referred to as having been shown to the said William Helmick is hereto attached and marked "Exhibit A."

W. H. Hurley.

Subscribed in my presence and sworn to before me by W. H. Hurley this the 1st day of September, A. D. 1889.

[Seal.] J. Don Darrow.

Notary Public for Louisa county.

[Here follows a copy of the part of Mr. Clark's testimony in question.]

THE STATE OF IOWA, LOUISA COUNTY, SS:

I, H. S. Hollingsworth, first being duly sworn on oath, state that the above is a true copy in part of the stenographer's report of the testimony of W. H. Clark before the Industrial Commission at Washington, D. C., and is the copy that was shown Wm. Helmick when he was requested to make deposition as to truth or falsity of the statements therein contained.

H. S. Hollingsworth.

Subscribed in my presence and sworn to before me by H. S. Hollingsworth this 1st day of September, A. D. 1899.

[Seal.] W. H. Hurley, Notary Public.

EXHIBIT 12.

THE STATE OF OHIO, FRANKLIN COUNTY, SS:

H. S. Hollingsworth, of lawful age, being duly sworn, upon his oath says: I reside at Columbus, Franklin county, Ohio. I have read the testimony of W. H. Clark before the Industrial Commission at Washington, D. C., in which he states that Wm. Helmick, formerly of Urbana, Ohio, has been unable to earn a livelihood in consequence of having been

drven out of he wholesale oil business at Urbana, Ohio, about four years prior to the present time. Deponent further saith that said Wm. Helmick, after quitting the wholesale oil business, continued in the retail oil business for a period of about two years, to the best of his knowledge and belief, and bought his supplies from the station of the Standard Oil Company, at Urbana, Ohio. Subseuently, said Wm. Helmick retired from the retail oil business, and removed to Louisa county, Iowa, where, on or about August 31, 1899, I found him employed in the canning factory of Baxter Bros., at Wapello, Iowa, at his trade, that of tinsmith, working at hard labor from ten to eighteen hours per day. I was informed by said Wm. Helmick and by Mr. Colby, the superintendent of the factory, that he said Wm. Helmick, had first been employed in his present capacity in 1898.

Further deponent saith not.

H. S. Hollingsworth.

Subscribed and sworn to by said H. S. Hollingsworth before me this 4th day of September, 1899.

[Seal.] H. N. Standart, Notary Public.

Helmick's so-called warehouse that Clark refers to was simply a temporary shed made of refuse, old car lumber. It had no value except for kindling wood, and Helmick afterwards used it for that purpose. I have Mr. Thomas Power's affidavit, which I submit. (Exhibit 13.)

EXHIBIT 13.

THE STATE OF OHIO, CHAMPAIGN COUNTY, SS:

Personally appeared before me, a notary public in and for said county, Thomas Powers, of lawful age, who, being duly sworn, deposes and says that he is a resident of Urbana, Champaign county, Ohio, and has been engaged in the business of draying for the past seventeen years; that he was acquainted with William Helmick, of Urbana, Ohio; that about three years ago he hauled a part carload of oil to a shed belonging to said Helmick, situated in the north part of the city of Urbana, near the city limits. The said shed was built of refuse lumber and material, and in his opinion said shed was not worth more than ten dollars.

Thos. Powers.

Subscribed and sworn to by said Thomas Powers before me this 28th day of August, 1899.

[Seal.] W. M. Rock,
Notary Public, Champaign county, Ohio.

Mr. Helmick did not lose any money during the few days he was trying to wholesale oil, therefore it is absurd and malicious for Clark to state that any action of ours drove Helmick to the poorhouse. The loss of his money was due to an entirely different cause. I have the affidavit of N. P. Cone, which I submit. (Exhibit 14.)

EXHIBIT 14.

THE STATE OF OHIO, CHAMPAIGN COUNTY, SS:

N. P. Cone, of lawful age, being duly sworn, upon his oath says:

I am a township trustee of Urbana township, Champaign county, Ohio, and have been for eight years. I am acquainted with William Helmick, formerly of Urbana, Champaign county, Ohio, and have been for twenty-five years past. I knew of his domestic troubles, having been informed of them by himself, and have frequently heard him complain of the extravagance of his family. On March 26, 1898, I signed an order committing said William Helmick to the county infirmary of Champaign county, Ohio, upon the report of several reputable citizens of Urbana, Ohio, of his destitute condition. The affiant further makes oath and says that he believes the cause of destitution of said William Helmick to have been the extravagance of his family and other domestic troubles as complained of by him, and due to no other cause.

N. P. CONE.

Subscribed and sworn to before me by the said N. P. Cone this 29th day of August, 1899.

W. M. ROCK,
Notary Public, Champaign County, Ohio.

AMOUNT OF OIL SOLD AT URBANA AND AT NEWARK.

His statement that the business at Urbana ran about 40,000 to 50,000 gallons per month is false, the average being only about one-half.

His statement that he held the position of manager at Newark is false. His position was that of local agent, same as at Urbana, three-fourths of his time being occupied in driving tank wagon and dray.

His statement that the average monthly output at Newark was 80,000 gallons is not true, the correct figures being less than one-half that amount.

AS TO SELLING GASOLINE AND OIL AT DIFFERENT PRICES TO DIFFERENT CUSTOMERS.

With reference to variation in prices at Newark on stove gasoline, the same situation was true elsewhere on account of the marked advance in price of gasoline. Many dealers at the time of the advance were under contract for a period of time; consequently the advance only applied to those who were not under contract, but as contracts expired the advance in price was charged to them as well as others.

Answering the general statements made by Clark relative to selling refined oil at cut prices at Newark, all dealers were treated alike. His statement that at Newark we charged Mr. Rankin 6 cents for oil and Showman Brothers 7½ cents is false. The facts are Showman Brothers bought their oil in bulk from the tank wagon, while C. C. Rankin bought oil in barrels and paid 1½ cents per gallon more than Showman Brothers paid for the same oil; but we allowed Rankin 75 cents when he returned the empty barrel, the equiva-

lent of 1½ cents per gallon, which made the net cost to both dealers the same.

His statement that Hagmeier, a dealer at Newark, was rebated 1 cent per gallon on gasoline and 2 cents on oil is false. Clark was given special permission to pay a rebate which was one-half cent per gallon on both oil and gasoline, under a contract. Mr. Clark paid the one-half cent himself, and then testified here that he paid 1 and 2 cents. He also presented a letter from George J. Hagmeier stating that he had received rebates, and I have an affidavit from Mr. Hagmeier showing how that letter was procured. (See Exhibit 15.)

EXHIBIT 15.

STATE OF OHIO, LICKING COUNTY:

Before me, a notary public in and for said county, personally appeared George J. Hagmeier, who is well known to me, and being first duly sworn, deposes and says that he has read the testimony of William H. Clark, given before the Industrial Commission at Washington, D. C., wherein said Clark read a certain note or statement purporting to be signed by him. That on or about the 18th day of February, 1898, said Clark came to him with a certain note or statement, which said Clark had previously prepared, and which said Clark requested affiant to sign. That to the best of this affiant's recollection, said note or statement was in the following language and figures, to-wit:

"Feb. 18, 1898.—Mr. Clark, A'gt Standard Oil Co., has paid me a great many rebates on goods which were receipted for when given."

Said Clark thereupon said to this affiant, and assigned as his reason for requesting said affiant's signature thereto, that he, said Clark, was short in his accounts with said Standard Oil Company, and that said shortage had been occasioned, in fact, by the payment of the rebates in said statement mentioned to this affiant, and that he desired to use said statement in accounting to said company for said shortage in his accounts. That said Clark assigned no other reason for desiring affiant's signature to said statement, and thereupon, and in order to assist said Clark in straightening his accounts with said company, affiant signed said statement as presented to him by said Clark, and in substance as above set forth. And further affiant saith not. GEO. J. HAGMEIER.

Sworn to before me and signed in my presence by George J. Hagmeier this 2d day of September, A. D. 1899.

[Seal.] WALTER A. IRVINE,
Notary Public in and for Licking County, Ohio.

I have another affidavit from Mr. Hagmeier regarding rebates, which I submit. (See Exhibit 16.)

EXHIBIT 16.

STATE OF OHIO, LICKING COUNTY, SS:

George J. Hagmeier, of lawful age, being duly sworn, upon his oath says:

I am a merchant operating the Pittsburg grocery stores, at different points. At the Newark branch I have had numerous business dealings with the Standard Oil Company through its former local agent, W. H. Clark. Under contract for a large quantity (my entire consumption for a certain period), I have received a rebate of one-half cent per gallon on gasoline and 2 cents per gallon on oil. I never received more than the one-half cent per gallon as per contract as aforesaid. GEO. J. HAGMEIER.

Subscribed and sworn to by said George J. Hagmeier before me, this 30th day of August, 1899.

[Seal.] DAVID M. KELLER, Notary Public.

NO FRAUDS OR TRICKS IN LAMP TESTS.

His statement that we used a trick in making lamp test is untrue. Competitors marketed an oil from Ohio crude, which was full of sulphur, at a reduced price; and as the dealers mixed this high-sulphur oil with our oil in their storage tank, and as the consumers were complaining about the quality, we were compelled to ask the dealers to keep our oil separate, that they might know whose oil was producing the trouble when their customers complained. It seemed impracticable in some cases for the dealers to have two storage tanks, so we were compelled, at a very large expense, to put on canvassers to visit the consumers and prove to them, by actual demonstration, that the standard quality of our oil had not been changed. Similar tests were made with the retail storekeepers, and it is the height of folly for any man to say that the people could be humbugged by the turning up of one flame higher than the other. That you gentlemen may fully understand the falsity of the statement made by Clark in relation to the drawing of several grades of oil from one tank by a "twist of the wrist," I wish to say that we have a tank wagon at Newark with three compartments, showing conclusively that we carry three grades of goods.

He states that D. J. Hull, H. S. Hollingsworth, E. G. Mathews, W. W. Hughes and W. A. Reed, all employes of the Standard Oil Company, had knowledge of frauds as testified by him in making lamp tests. Mr. W. A. Reed is not in our employ and was not at the time Mr. Clark testified. I submit the affidavits of all these gentlemen to prove the falsity of Clark's statements.

EXHIBIT 17.

THE STATE OF OHIO, CHAMPAIGN COUNTY, SS:

D. J. Hull, of lawful age, being duly sworn, upon his oath says: I am in the employment of the Standard Oil Company of Ohio, and have been for several years. I have read the statement of the testimony of W. H. Clark before the Industrial Commission at Washington with reference to testing Ohio and Pennsylvania oils, and giving my name as one who could corroborate his statements. I desire to say that his statements as to the method of these tests are absolutely false. I never heard of any instructions of any practice of the character stated by him. When these comparative tests are made, lamps of the same size, burners of the same kind, wicks of the same make, and

chamneys of the same make are always used, and at the beginning of the test the height of the flame in each lamp is precisely the same. I never knew of any deception being used in these tests.

D. J. HULL.

Subscribed and sworn to by said D. J. Hull before me, this 28th day of August, 1899.

[Seal.] W. F. RING, Notary Public.

EXHIBIT 18.

THE STATE OF OHIO, FRANKLIN COUNTY, SS:

H. S. Hollingsworth, of lawful age, being duly sworn, upon his oath says: I am in the employment of the Standard Oil Company of Ohio, and have been for several years. I have read a statement of the testimony of W. H. Clark before the Industrial Commission at Washington with reference to testing Ohio and Pennsylvania oils, and giving my name as one who could corroborate his statements. I desire to say that his statements as to the method of these tests are absolutely false. I never heard of any instructions or any practice of the character stated by him. When these comparative tests are made, lamps of the same size, burners of the same kind, wicks of the same make, and chimneys of the same make are always used, and at the beginning of the test the height of the flame in each lamp is precisely the same. I never knew of any deception being used in these tests.

H. S. HOLLINGSWORTH.

Subscribd and sworn to by said H. S. Hollingsworth before me, this 28th day of August, 1899.

[Seal.] ERNEST T. HARE,
Notary Public, Franklin County, Ohio.

EXHIBIT 19.

THE STATE OF OHIO, FRANKLIN COUNTY, SS:

E. G. Mathews, of lawful age, being duly sworn, upon his oath says: I am in the employment of the Standard Oil Company of Ohio, and have been for several years. I have read a statement of the testimany of W. H. Clark before the Industrial Commission at Washington with reference to testing Ohio and Pennsylvania oils, and giving my name as one who could corroborate his statements. I desire to say that his statements as to the method of these tests are absolutely false. I never heard of any instructions or any practice of the character stated by him. When these comparative tests are made, lamps of the same size, burners of the same kind, wicks of the same make, and chimneys of the same make are always used, and at the beginning of the test the height of the flame in each lamp is precisely the same. I never knew of any deception being used in these tests.

E. G. MATHEWS.

Subscribed and sworn to by said E. G. Mathews before me, this 28th day of August, 1899.

[Seal.] ERNEST T. HARE,
Notary Public, Franklin County, Ohio.

EXHIBIT 20.

THE STATE OF OHIO, LICKING COUNTY, SS:

W. W. Hughes, of lawful age, being duly sworn, upon his oath says: I am in the employment of the Standard Oil Company of Ohio, and have been for several years. I have read a statement of the testimony of W. H. Clark before the Industrial Commission at Washington with reference to testing Ohio and Pennsylvania oils, and giving my name as one who could corroborate his statements. I desire to say that his statements as to the method of these tests are absolutely false. I never heard of any instructions or any practice of the character stated by him. When these comparative tests are made, lamps of the same size, burners of the same kind, wicks of the same make, and chimneys of the same make are always used, and at the beginning of the test the height of the flame in each each lamp is precisely the same. I never knew of any deception being used in these tests.

W. W. HUGHES.

Subscribed and sworn to by said W. W. Hughes before me this 30th day of August, 1899.

[Seal.] FREDERICK M. BLACK,
Notary Public.

EXHIBIT 21.

THE STATE OF OHIO, WASHINGTON COUNTY, SS:

W. A. Reed, of lawful age, being duly sworn, upon his oath says: I was in the employment of the Standard Oil Company of Ohio, as its agent in Marietta up to November 1, 1898, but since that time have not been connected with the company. I have read a statement of the testimony of W. H. Clark before the Industrial Commission at Washington with reference to testing Ohio and Pennsylvania oils, and giving my name as one who could corroborate his statements. I desire to say that his statements as to the method of these tests are absolutely false. I never heard of any instructions or any practice of the character stated by him. When these comparative tests are made, lamps of the same size, burners of the same kind, wicks of the same make, and chimneys of the same make, are always used, and at the beginning of the test the height of the flame in each lamp is precisely the same. I never knew of any deception being used in these tests.

W. A. REED.

Subscribed and sworn to by said W. A. Reed before me, this 31st day of August, 1899.

[Seal.] FRANK PANHORST,
Notary Public, Washington County, Ohio.

LUBRICATING OILS.

Concerning his general statement on lubricating oils, he refers to our trade-mark brands on which there is no competition and for which we have a regular schedule, the price varying only in accordance with the quantity used and the cost of delivering same to customers. Inasmuch as no competitor can sell these

oils, there is no necessity for our making any different price other than our schedule.

THE ALLEGED PURCHASE OF A WAREHOUSE TO DRIVE A COMPETITOR OUT OF BUSINESS.

His statements concerning the purchase and removal of an alleged warehouse at Newark, in order to drive out a competitor, are false. After the so-called warehouse was purchased, Donaldson, the person whom Clark claimed we drove out of business by the purchase of a shed from its owner (without Donaldson's knowledge), continued in business by renting a barn. Further, Clark purchased the shed unknown to and unauthorized by me or Mr. Hollingsworth, and moved the building to his (Clark's) own private lot, for his own private use, and paid for by him, and not by us.

We derived no benefit from the transaction, and I criticised Clark severely when the subject came to my notice. This so-called warehouse, emphasized so largely by Clark, was only an old shed, about 4 feet by four feet, with capacity for simply one barrel of oil. I have Mr. Hollingsworth's affidavit, which I submit.

EXHIBIT 22.

THE STATE OF OHIO, LOUISA COUNTY, SS:

H. S. Hollingsworth, of lawful age, being duly sworn, upon his oath says: I am in the employ of the Standard Oil Company of Ohio, and have been for several years. With reference to the purchase of a warehouse at Newark, which W. H. Clark, in his testimony before the Industrial Commission mentions, I desire to say that I did not authorize this purchase, nor did I know of it before it was made, and it is not true that I offered Mr. Clark a two weeks' vacation on salary, or any consideration of any kind whatever, if he would get Donaldson out of the business. The first I knew of the transaction, Clark had purchased the building for $2.50, and moved it on to his own private lot, and Clark stated to me that he bought the shed on account of needing it for an outhouse. The so-called "warehouse" was about 4 feet by 4 feet, with a capacity for storing a single barrel of oil, and in my judgment $2.50 was an excessive price for it. The purchase of the shed did not drive Donaldson out of the business, for he rented a barn afterwards in which to store his barreled oil.

H. S. HOLLINGSWORTH.

Subscribed and sworn to by said H. S. Hollingsworth, before me, this 30th day of August, 1899.

[Seal.] W. H. HURLEY, Notary Public.

Referring to his statement concerning Mr. King, and others at Newark, running tank wagons, it is very misleading because the term generally applies to our method of delivery to the retail trade, whereas they were peddlers who ran their own wagons, bought their oil from us and made whatever price to the consumer they desired, and were practically regulated by the price made by retail stores. We had nothing whatever to do with fixing such prices—these peddlers all working for themselves.

CIRCUMSTANCES UNDER WHICH MR. CLARK LEFT THE STANDARD.

Mr. Lockwood was not a manager nor a special inspector, but simply a traveling auditor, whose duty it was to visit stations, check up stocks, balance cash, check accounts, and see that our agents were conducting the business honestly. Mr. Clark's reports were not received regularly, and after I had requested him repeatedly to give the matter prompt attention (and he had failed to do so), at my request Mr. Lockwood was sent to Newark to check Clark up. He did so, and after balancing the cash (which is the first thing an auditor does) he found it short. This was reported to me and I suspended Clark until Mr. Lockwood had completed his examination. Further investigation disclosed the fact that collections had been made by Clark and not reported. Some of these items were made good by Clark from day to day by payments to Mr. Lockwood on the theory that they were errors. They, however, became so numerous that Mr. Lockwood finally refused to receive any more payments until he had completed his examination, when, according to custom, he would make a final report and leave the adjustment to the officers of the company.

From the time I suspended him up to date I have never tried to re-engage him, directly or indirectly, through Mr. Fouts or anyone else. I submit Mr. Fout's affidavit showing that he has not.

EXHIBIT 23.

THE STATE OF OHIO, FRANKLIN COUNTY, SS:

R. A. Foutz, of lawful age, being duly sworn, upon his oath says: I am in the employ of the Standard Oil Company, and am the person referred to in the testimony of W. H. Clark before the Industrial Commission. It is not true, as stated by him, that since Clark's discharge by the Standard Oil Company I have asked him to re-enter the company's employ, or ever asked him how he would work for the company again. I am a traveling man and have no authority whatever to employ for the company, and I have never had any talk of any kind whatever with Mr. Clark upon the subject. R. A. FOUTZ.

Subscribed and sworn to by said R. A. Foutz before me, this 28th day of August, 1899.

[Seal.] E. L. PEASE,
Notary Public, Franklin County, Ohio.

Nor is there any truth in his statement concerning our methods of deducting from his salary errors which others made.

The inspector's report referred to, a copy of which he filed with you, is not a part of the auditor's work, nor did the auditor have anything whatever to do with it, nor was it made out by him at that time, nor at any other time; consequently Clark's statement concerning it are false. The blank referred to is the one that I

require filled out by a special agent as occasion requires. Since my arrival in Washington I have examined the inspector's report submitted by Mr. Clark, and find that it is signed by H. S. Hollingsworth, who made the inspection and filled out the blank.

The final report of our auditor showed Mr. Clark's shortage to be $231.57. He made good $121.93. The balance, $109.64, was paid in full by his bonding company after they had examined the report and found it correct.

He was finally arrested by the bonding company, who had signed his bond as agent.

Q. (By Mr. Phillips.) What became of him after his arrest? A. He was arrested on a charge of embezzling $109.64, which is a sum largely in excess of the amount, $35, required under Ohio laws to constitute a felony. He was bound over by the examining magistrate. It appears that the aggregate was taken in small sums, and at different times, no one amounting to $35, or sufficient to constitute a felony under the Ohio statutes. Therefore, I understand the grand jury failed to indict, on the ground that the offenses could not be joined together, and no felony had been committed; only petty larceny.

DIFFERENCES OF PRICE.

Q. (By Mr. Jenks.) One or two questions as to the general method of doing business. You state in your testimony that wherever you have known of rivals cutting rates you intended to meet them to protect yourself. It is true, I suppose, that you had some special contracts, and in that way sold at somewhat different rates to different dealers? A. Occasionally we have a special contract, the consideration being that the dealer buys his entire supply from us. But these contracts are very limited in number, and the concession very rarely exceeds one-half cent a gallon.

Q. So that it would be possible that Mr. Clark would have received instructions from you to sell the same quality of oil to different dealers at different rates under these contracts you had made? A. As I stated, we had contracts on stove gasoline, two or three of them, in Newark, at a time gasoline advanced, and the advance did not apply to these dealers until the contract expired. That made two different prices at Newark on stove gasoline at that time.

Q. You would not be likely, then, you think, to have contracts with different dealers in the same place, covering the same time, under which the same grade of oil would be sold at different prices? A. There might be an exceptional case of that kind.

Q. The different prices being granted, as you have suggested, in consideration of the buyers purchasing their entire supply of you? A. Yes.

Q. Do you recollect special instances, for example, of instructions to sell Capitol cylinder oil to these different parties, Mr. Linafelter and the Newark Water Works, at 32 and 31? A. I do not remember. These contracts on lubricating oil are largely conditioned upon the quantity of oil purchased by the consumer and the expense of delivering.

Q. Some slight variation on that account made from time to time? A. Yes.

Q. (By Mr. Smyth.) Such a variation as that might arise in any business, might it not? A. Certainly.

Q. (By Mr. Clark.) That, you say, is confined to lubricating oil? A. These are lubricating prices.

Q. (By Mr. Jenks.) The variations in prices, I understand you to say, are much less than 1 cent a gallon? A. On illuminating oil, I do not recall any case where it is more than a half cent.

WATCHING RIVALS' BUSINESS.

Q. Reference was made by Mr. Clark, and reference has also been made by other witnesses, to the way in which the Standard Oil Company has secured information regarding the business of its rivals. You yourself have referred to it; it is your custom to have reports from your different agents? A. We ask our salesmen and our agents to keep their eyes open and keep us informed of the situation in their respective fields. We ask our agents, as they visit the trade, to make reports to us of whom the different parties are buying; principally to know whether our agents are attending to their business or not. If they are letting too much business get away from them, it looks as if they were not attending to their business. They get it from what they see as they go around selling goods.

Q. (By Mr. Jenks.) Where competition is fierce do you engage anyone to follow the competitor's wagon about to find out what prices he sells at and to whom he sells? A. No, sir; I do not recall any case of that kind.

Q. Have you yourself secured reports, or has there been any case that you know of in which reports of rivals' business have been secured from employes of those rivals? A. No, sir; never.

Q. You instruct your local agents, I infer from what you state here, as to the prices at which they are to sell lubricating oil to different dealers? A. The prices they are to receive represent either an arrangement or contract made with the different firms for oil at certain periods at these prices, and the arrangement is made with the understanding that we are to have the entire business for a certain period, possibly a year.

Q. (By Mr. Smyth.) Have you not under these contracts reduced the price during the year when you had a contract, say 32 cents for Capitol cylinder oil—have you not voluntarily reduced the price one-half cent? A. Notwithstanding the contract, we may have done that on a declining market.

Q. (By Mr. Jenks.) In the selling of lubricating oils to railroads, do you, in the same way, instruct your agents as to the prices they are to charge? A. I do not have anything to do with railroad oils; they are handled by our people in Cleveland.

Q. You have no knowledge on that subject at all? A. I have no knowledge on that subject.

Q. (By Mr. Phillips.) Is it your custom to put down oil in one locality, where there is competition, as a rule? Do you make that a rule? A. No, sir; we never do it unless the competitor makes the cut in price first and forces us to it. When the competitor makes a cut in prices we do not hesitate to meet the price to hold our business.

Q. You do not take the lead in the State of Ohio, under your jurisdiction, then, in cutting prices when there is an independent refinery that ships oil into that locality? A. No, sir; we do not.

Q. (By Mr. Blatchford.) In what capacity are you serving the Standard Oil Company now? A. I have charge of a marketing department of the company.

Q. For the State of Ohio? A. The central and southern portions of Ohio.

Q. You have presented a dozen or more affidavits from the gentlemen whose names are signed. Are all those gentlemen employes of the Standard Oil Company? A. Not all of them; probably three-fourths.

Q. Have the affidavits come to you voluntarily from these men? A. Yes.

Q. Without any solicitation? A. Simply upon being shown the testimony and being asked if correct, and whether they desired to make affidavit. It has all been voluntary on their part.

Q. I see the affidavits you have read are similar both in language and appearance. Were they gotten up in your office or some office of the Standard Oil Company and sent to the employes? A. Some of these affidavits —not all of them, but a number of them—were gotten up in my office, covering the points of Clark's testimony, and were then submitted to the person concerned, and he was asked whether the facts contained in the affidavit were true, and if they were, whether he was willing to sign it.

Q. (By Mr. Smyth.) I suppose that was largely a matter of convenience? A. Yes.

Q. (By Mr. Blatchford.) Were there any affidavits asked from employes who refused to give them? A. No.

Q. They gave an affidavit in every case? A. Yes, sir; every one.

(Testimony closed.)

WASHINGTON, D. C., September 8, 1899.

TESTIMONY OF MR. JOHN D. ARCHBOLD.

At a meeting of the United States Industrial Commission, held in Washington, D. C., September 8, 1899, Vice Chairman Phillips presiding, Mr. John D. Archbold, after being duly sworn, testified on the subject of trusts as follows:

Q. (By Mr. Jenks.) Will you kindly give your name and address to the stenographer? A. John D. Archbold, New York City.

Q. What is your relation with the Standard Oil Company? A. I am vice president of the Standard Oil Company of New York.

Q. How long have you been connected with the Standard Oil Company? A. Since 1875.

Q. Have you, in anticipation of this examination, prepared any special statement for the use of the commission? A. I have.

Q. I shall be glad if you will give that first, and then we will question afterwards. A. The general statement in answer to specific inquiries is not quite ready, and that will be furnished you within a few days.

Q. You mean in answer to the general schedule? A. Yes.

Q. (By Mr. Smyth.) I think it would be well to ask Mr. Archbold just at this stage to give us some detailed account of the organization of the Standard Oil Company—its different departments. We do not want the names of the individuals, but your transportation department—how is it managed? A. That will all be furnished—all a part of the statement just in course of preparation.

Q. (By Mr. Jenks.) You will give a general statement in your own way of the points you care to bring out.

The Witness: It would be a matter of preference to me, and I think it would make what I have to say more intelligible to you all, if I might first be allowed to answer the criticisms of the witnesses who have appeared, and so let my answers lead up to a short general statement which I might make at the last.

The Chairman. Certainly.

The Witness. Shall I proceed?

The Chairman. Yes.

J. W. LEE THE HEAD OF A TRUST.

The Witness: I answer first the testimony of Mr. J. W. Lee, of Pittsburg. It is rather remarkable, gentlemen, that the first witness to appear before you as a critic of our business on the ground of its being a trust, should, at the outset, have acknowledged himself to be not only a member of, but the real head of a trust. This Mr. Lee specifically does acknowledge, and I may say for your information, that Mr. Lee and his associates have gone a step further than any other company that I know of, in that they have bound themselves together, not only by the ordinary trust ties, but in a voting trust, made up of a majority of the stock of their principal companies, with a view to perpetuating their faction in power indefinitely, and practically disfranchising the minority.I make this statement, gentlemen, not as a criticism, but as rather a striking evidence of the irresistible tendency toward combination.

VOTING TRUST CONTRACT OF THE UNITED STATES PIPE LINE COMPANY.

I hand you a copyof the voting trust of the United States Pipe Line. The original trustee under it was a Mr. Wood, who has since died. He has been succeeded, under this voting trust, by three trustees, viz., Thomas W . Phillips, L. Emery, Jr., and Hugh King.

Agreement made April 26, 1893, is as follows:

"Whereas each of the undersigned is a subscriber to the capital stock of the United States Pipe Line Company, and is now a stockholder thereof, and each is interested pecuniarily in the oil business either as refiner, producer of crude, exporter, owner of terminal facilities at or near tidewater, or dealers in petroleum and its products for domestic consumption;

gregate, if present, except as hereinafter provided.

4. In case of differences of opinion among the trustees present at any such meetings as to how such votes shall be cast in regard to any matter or thing to be voted on, they shall be cast as the representatives of four-fifths of all the shares held under this trust may direct in writing, if so demanded in writing by any of the trustees.

5. Any trustee unable to attend any meeting of shareholders and to personally cast the votes he would be entitled to cast if present, may authorize any other trustee to cast the vote which he would be entitled to cast if personally present, which authority shall be in writing, approved by three-fifths of the trustees other than himself.

6. When none of the trustees can be present at any meeting of the stockholders, legally held, they may be represented in proxy by an attorney appointed in writing, executed by three-fifths of the trustees.

7. The trustees may exercise such consent in writing as in their opinion it may be right and proper for them to do in the interests of the Pure Oil Company, and of the owners of the shares held by them in trust; provided that no such consents shall be executed against the objection of the equitable owners of 10 per cent of the shares held by them in trust, unless after the question of executing such consent shall have been submitted in person, or by writing properly addressed, to the several equitable owners of the shares held in trust, and approved in writing by such owners of three-fifths of such shares.

8. The number of trustees may be increased or diminished at any time, and one-third of the trustees shall retire each year, and their successors in the trust elected at each annual meeting of the company. Those of the trustees whose names first occur in alphabetical order shall retire at the next annual meeting, and so on, and their successors shall be elected in the same manner as directors are elected, but nothing herein shall render any trustee ineligible to re-election. Any trustee may be removed, without assignment of cause or reason therefor, by three-fifths of the trustees and the written consent of the equitable owners of three-fifths of the shares held in trust hereunder; and upon such removal, or on the filing of such written consent with the secretary of the company, and on the notice in writing delivered to the party removed, or sent by registered letter to his proper address, the rights, duties and obligations of such party as trustee shall immediately cease.

9. In case of the death, resignation, or removal of any of the trustee, the trust shall be exercised by the remaining trustees until the vacancy be filled by the appointment of new trustees for that purpose, on the nomination of the equitable owners of a majority of the shares previously represented by the trustee whose place is vacated, with the consent in writing of the equitable owners of three-fifths of the shares held under this trust and the approval of three-fifths of the trustees.

10. No trustee has any such beneficial interest in this trust personally as to entitle him to maintain any action at law or in equity to enjoin, delay, hinder, or prevent his removal from the trusteeship, or to recover damages on account thereof from the company or the trustees, or from the individual stockholders by whose action he may have been removed.

11. The trustees shall appoint a chairman and secretary who shall hold these offices for one year, and until their successors shall be qualified; and shall keep regular accounts, showing the ownership and residences of the various equitable owners of the shares held by them in trust; and shall execute and deliver to such several owners certificates in due form, approved by the directors of the company, evidencing the number of shares held by them in trust for each of the several owners; and shall make such transfers of any of the shares as they may be requested to do by such several owners, on the surrender of such certificates representing such shares, properly indorsed, assigning for transfer, subject to the terms of this trust, any of the shares thereby represented, in the manner prescribed for making such transfers.

12. The trustees shall immediately advise the company by writing, addressed to the secretary, of any transfer of ownership of any of the shares held by them; and shall, on written request of the treasurer of the company, certify to him the names and residences of all equitable owners of shares held by them in trust; and shall sign warrants for the payment to such owners, severally, of any dividends to which they may be entitled on the shares so held in trust.

Third. This agreement may be changed at any time only with the consent in writing of the Pure Oil Comapny, three-fifths of the persons acting at the time as trustees hereunder, and of the equitable owners of three-fifths of the shares held in trust hereunder.

Fourth. This agreement may be cancelled, and the trust thereby created dissolved, only by the winding up of the Pure Oil Company, or by the consent in writing, duly excuted, of the equitable owners of three-fifths of the shares held in trust hereunder and of three-fifths of the other shares of the company, after providing in full for the redemption or purchase at one hundred and ten dollars per share, in cash, of all the preferred shares of the company at the time outstanding.

Fifth. The said Thomas W. Phillips, Lewis Emery, jr., Rufus Scott, Clarence Walker, Louis Walz, James W. Lee, David Kirk, Marcus L. Lockwood, Jerome B. Akin, Chas. H. Duncan, Hugh King, Michael Murphy, Adolphus A. Hoch, Ferdinand Riber, and Walter A. Dennison hereby accept the trust herein conferred and imposed on them.

In witness whereof the parties have severally signed this agreement as of the — day of ———, A. D. 189—.

"This agreement, made and entered into by the Pure Oil Company, a corporation organized and existing under the laws of the State of New Jer-

sey; David Kirk, Jerome B. Akin, Marcus L. Lockwood, Walter A. Dennison, Charles H. Duncan, Theodore B. Westgate, Wm. L. Curtis, James W. Lee, and David Kirk, trustee for the McCalmont Oil Company, several subscribers to and owners of the capital stock of the said Pure Oil Company; and Thomas W. Phillips, Lewis Emery, jr., Rufus Scott, Clarance Walker, Louis Walz, James W. Lee, David Kirk, Marcus L. Lockwood, Jerome B. Akin, Charles H. Duncan, Hugh King, Michael Murphy, Adolphus A. Hoch, Ferdinand Reiber, and Walter A. Dennison, parties mutually agreed upon to exercise the trusts created hereunder.

"Witnesseth. That whereas, the said Pure Oil Company is formed for the purpose of engaging in directly and of aiding other companies and parties engaged in the production, transportation, storage, manufacture and sale of crude petroleum and its products, and in any business incident thereto, and it is desired to enlist therein the co-operation of other parties, and to procure capital to be invested in the shares of its capital stock, and in such other ways as may be desirable, which investments are to be solicited from parties not now interested in the company; and 'whereas, it is advisable, equitable, essential, and intended for the safety and advantage of all interests that the control of the said Pure Oil Company shall be secured permanently, as to prevent and render impossible at all times the diversion of its resources and business from their intended use and course, in oppositition to monopoly in the business, and to permanently protect and maintain what are known as the 'independent interests' in the petroleum industry, and to maintain the policy agreed on for conducting the business of the company in the interest and for the protection of all rights in the company, created by mutual agreement of shareholders, or by operation of law; therefore the said parties hereto, in consideration of the sum of one dollar by each to each of the others paid, the receipt of which is hereby acknowledged by each, and in further consideration of the mutual benefits received, to be received, or expected from the agreements, covenants, and trusts hereinafter contained, and from the undertakings and business to be promoted, do hereby agree and consent to the various acts and things hereinafter set forth; provided, however, that no party hereto shall be bound to do any act or thing, or be responsible for the results or consequences of any act or thing done or omitted to be done, except so far as relates to such act or thing as he himself expressly undertakes to do and perform; and do further agree as follows:

"First. The capital stock of the Pure Oil Company, as authorized in its certificate of organization, is to be one million ($1,000,000) dollars, represented by two hundred thousand (200,000) shares of the legal par value of five ($5.00) dollars each, divided into classes, and to be issued, held, and transferred, subject and according to law, and the by-laws, rules, and regulations adopted and approved by all the shareholders of the company, a copy of which is hereto attached and referred to.

"Second. The said David Kirk, Jerome B. Akin, Marcus L. Lockwood, Walter A. Dennison, Chas. H. Duncan, Theodore B. Westgate, William A. Curtis, James W. Lee, and David Kirk, trustee of the McCalmont Oil Company, are the owners of all the shares of the capital stock now subscribed, amounting to three thousand (3,000) shares, of which they hereby transfer to the said Thomas W. Phillips, Lewis Emery, jr., Rufus Scott, Clarence Walker, Louis Walz, James W. Lee, David Kirk, Marcus L. Lockwood, Jerome B. Akin, Charles H. Duncan, Hugh King, Michael Murphy, Adolphus A. Hoch, Ferdinand Reiber, and Walter A. Dennison sixteent hundred (1,600) shares, being more than a majority of the shares of the company now subscribed, and agree that one-half of all the shares hereafter subscribed and issued shall be transferred in like manner to the said parties and their associate trustees, as may be appointed, to be by them held in trust for the uses and purposes herein proposed, and subject to the terms and conditions as follows:

"1. The equitable ownership of the trust shares and all interests therein shall be subject to the terms of this trust agreement; such ownership of the shares or interests therein may be sold at the will of the holder, but no sale, transfer, or conveyance of such ownership or interests shall give to the purchaser any rights other than are provided for in the by-laws, rules, and regulations of the company, and in accordance with this trust. The trustees hereunder shall at all times be recognized as the legal owners and holders of the trust shares to carry into effect the purposes of this trust, and all equitable owners of the shares or interests therein shall specifically agree in writing to the terms of this trust; and no transfer of any such shares or interest shall be made, or be effective if made, until the transferee of such equitable ownership or interest shall have agreed in writing to receive and hold the same subject to the provisions of this trust.

"2. At all meetings of the company for the election of directors, or for any other purpose, to cast the entire number of votes which, as holders of the said shares they would be entitled to cast.

"3. Each trustee at such meetings shall be entitled to cast an equal number of all the votes which all of the trustees would be entitled to cast in the aggregate, if present, except as hereinafter provided.

"4. In case of differences of opinion among the trustees present at any such meetings as to how such votes shall be cast in regard to any matter or thing to be voted on, they shall be cast as the representatives of four-fifths of all the shares held under this trust may direct in writing, if so demanded in writing by any of the trustees.

"5. Any trustee unable to attend any meeting of shareholders and to personally cast the votes he would be entitled to cast if present, may authorize any other trustee to cast the vote which he would be entitled to cast if personally present, which authority shall be in writing, approved by three-fifths of the trustees other than himself.

"6. When none of the trustees can be present at any meeting of the stockholders, legally held, they

may be represented in proxy by an attorney appointed in writing, executed by three-fifths of the trustees.

"7. The trustees may execute such consents in writing as in their opinion it may be right and proper for them to do in the interest of the Pure Oil Company and of the owners of the shares held by them in trust, provided that no such consents shall be executed against the objection of the equitable owners of 10 per cent of the shares held by them in trust, unless after the question of executing such consent shall have been submitted in person, or by writing, properly addressed to the several equitable owners of the shares held in trust, and approved in writing by such owners of three-fifths of such shares.

"8. The number of trustees may be increased or diminished at any time, or any trustee may be removed, without assignment of cause or reason therefor by three-fifths of the trustees and the written consent of the equitable owners of three-fifths of the shares held in trust hereunder; and upon such removal, or on filing of such written consent with the secretary of the company, and on notice in writing delivered to the party so removed or sent by registered letter to his proper address, the rights, duties and obligations of such party as trustee shall immediately cease.

"9. In case of the death, resignation, or removal of any of the trustees, the trust shall be exercised by the remaining trustees until the vacancy be filled by the appointment of new trustees for that purpose, on the nomination of the equitable owners of a majority of the shares previously represented by the trustees whose place is vacated, with the consent, in writing of the equitable owners of three-fifths of the shares held under his trust and the approval of the three-fifths of the trustees.

"10. No trustee has any such beneficial interest in this trust, personally as to entitle him to maintain any action at law or in equity to enjoin, delay, hinder, or prevent his removal from the trusteeship, or to recover any damages on account thereof from the company or the trustees, or from the individual stockholders by whose action he may have been removed.

"11. The trustees shall appoint a chairman and secretary and shall keep regular accounts showing the ownership and residence of the various equitable owners of the shares held by them in trust and shall execute and deliver to such several owners certificates in due form, approved by the directors of the company, evidencing the number of shares held by them in trust for each of such several owners, and shall make such transfers of any of the shares as they may be requested to do by such several owners, on the surrender of such certificates representing such shares, properly endorsed, assigned for transfer subject to the terms of this permanent trust, any of the shares thereby represented in the manner prescribed for making such transfer.

"12. The trustees shall immediately advise the company, by writing, addressed to the secretary, of any transfer of ownership of any of the shares held by them; and shall, on written request of the treasurer of the company, certify to him the names and residences of all equitable owners of shares held by them in trust; and shall sign warrants for the payment to such owners, severally, of any dividends to which they may be entitled on the shares so held in trust.

"Third. This agreement may be changed at any time with the consent, in writing, of the Pure Oil Company, three-fifths of the persons at the time acting as trustees hereunder, and of the equitable owners of three-fifths of the shares held in trust hereunder.

"Fourth. This agreement may be cancelled and the trust hereby created dissolved only by the winding up of the Pure Oil Company, or by the consent in writing, duly executed, of the equitable owners of four-fifths of the shares held in trust hereunder, and of four-fifths of all the other shares of the company, after providing in full for the redemption or purchase at one hundred and ten dollars per share, in cash, of all the preferred and common shares of the company at the time outstanding.

"Fifth. The said Thomas W. Phillips, Lewis Emery, jr., Rufus Scott, Clarence Walker, Louis Walz, James W. Lee, David Kirk, Marcus L. Lockwood, Jerome B. Akin, Charles H. Duncan, Hugh King, Michael Murphy, Adolphus A. Hoch, Ferdinand Reiber and Walter A. Dennison hereby accept the trust herein conferred and imposed on them.

"In witness whereof the parties hereto have severally signed this agreement as of the 6th day of November, A. D. one thousand eight hundred and ninety-five.

"Pure Oil Company,
"David Kirk, President,
"C. H. Duncan, Treasurer.

"Incorporators: David Kirk, Jerome B. Akin, Marcus L. Lockwood, Walter A. Dennison, C. H. Duncan, Theodore B. Westgate, David Kirk, trustees for McCalmont Oil Company; W. L. Curtis, Thomas W. Phillips, David Kirk, Marcus L. Lockwood, Clarence Walker, James W. Lee.

"Trustees: Walter A. Dennison, Jerome B. Akin, C. H. Duncan, Adolphus A. Hoch, Ferd. Reiber, Louis Walz, Rufus Scott, Lewis Emery, jr., M. Murphy, H. King."

DID NOT ISSUE CIRCULARS AGAINST FREE PIPE LINE LAW.

Mr. Lee charges that we fought the passage of the free pipe bill in the Pennsylvania legislature, and that we caused "dodgers" or small handbills to be circulated, saying that if the free pipe bill became a law the orchards would be destroyed, springs polluted, death lurk in their doorsills. I want to deny this in toto. In those early days to which he referred we were in favor of the passage of the free pipe law in Pennsylvania. We greatly desired it. We were entering the pipe line business, fully understanding its great importance to the fu-

ture of the petroleum trade, and it is not likely that we would be prejudiced by any such action as Mr. Lee claims.

Q. (By Representative Livingston.) You deny the issuing of the circular? A. I deny the issuing of the circular in toto I never heard of any testimony of that kind.

Q. (By Mr. Smyth.) Do you know whether such circulars were issued? A. I do not.

Q. If you did not issue them, who did? A. I do not know that they were issued.

EMPIRE TRANSPORTATION COMPANY.

He refers in the way of criticism to our course regarding our relations with the Pennsylvania road in connection with the Empire Transportation Company refinery. I may say, in a word of explanation, that at the time specified the people prominent in official relations with the Pennsylvania road engaged in the petroleum business on their own account. We, deeming that outside of the regular province of the railroad company, of which we were large patrons, discontinued our shipments over the Pennslyvania road, transferring them to the other great lines. This loss of traffic finally brought the Pnnsylvania officials proper to a negotiation regarding this special refining business, to which I have referred, and those negotiations resulted in our purchase of those refineries and our again becoming a patron, in the way of transportation, of the Pennsylvania railroad. That is the exact history of the case simply told. I will refer now to—

Q. (Interrupting.) Are you willing to state what the negotiations were? A. I would be glad to if I had it in mind; but it is a transaction of nearly 20 years ago, and I cannot, from memory, give any really exact outline of it.

Q. Were there considerable advantages offered to the Standard Oil Company over other shippers? A. There were no advantages offered to the Standard Oil Company. The advantage was in favor of their own people, as we felt it to be, and was the prime particular reason for our discontinuing our shipments over it.

Q. After these negotiations did the Standard Oil Company enjoy secret rates or better rates than other refiners? A. I go into that fully in answer to the specific charges to that effect.

Q. (By Mr. Farquhar.) Were the Pennsylvania railroad holders of oil participants with you in transportation at the same time you made arrangements with the Pennsylvania? A. No, their relations ceased.

Q. (By Mr. Jenks.) You can furnish that account more in detail, can you not? A. Undoubtedly, if you desire it.

The Empire Line and Green Line were corporations doing freight business over the Pennsylvania railroad, the stocks of which were owned by the officers and managers of the railway. Through these companies the railway became interested both in transportation of oil by pipe lines and in the refining of oil. The Standard Oil Company claimed that the railway discriminated in freights in favor of its own refineries, and refused to ship over that road. This led to negotiations for the sale of the pipe lines and refineries to persons interested in the Standard. This sale took place October 1, 1877. The railway first purchased from the Empire and Green Lines all the pipe lines and refineries which they owned ,which it was empowered to do by virtue of an existing contract, and then conveyed the pipe lines and refineries to the Standard parties.

MR. EMERY'S ESTIMATE OF $10,000,000 REBATES.

Mr. Lee goes quite into detail with reference to allegations regarding preferential railroad rates to us during that early period of the oil business. I want to answer all his charges made at different times during his testimony as is indicated; and by referring to the various pages at once and as definitely as possible. He treated first the well-worn statement regarding deductions originally made by Mr. Emery, or alleged to be made by him, from the testimony of Mr. Cassatt, an official of the Pennsylvania road, covering alleged rebates paid to our company for a certain period. I have here, and desire to submit and leave with you, a statement of the analysis of Mr. Cassatt's testimony in that regard, prepared by our counsel at the time, showing the utter falsity of Mr. Emery's statement. Mr. Emery's statement was made on an absolutely false hypothesis throughout. There never was any foundation for it. It was one of those catching statements which take hold and travel fast. It has been denied over and over again; but the people who have agitated these questions have adopted it as one of their stock features in trade and keep on repeating it. I desire to submit this analysis, but I will read:

"The assertion that Mr. Cassatt testified that $10,000,000 was paid to the Standard Oil Company as rebates from October 17, 1877, to March 31, 1879, was first made by Mr. Lewis Emery and in examination before the Committee on Manufactures of the Fiftieth Congress, May, 1888, he shows how he deduced these figures from the testimony referred to. I quote from page 241:

"Q. You were also authority were you not, for the statement which is referred to in Mr. Dodd's book that it was proved during that examination that in a period of, I think, 17 months—

"The witness (interrupting). Seventeen and one-half months.

"Q. (Continuing). The four railroad companies had paid the Standard Oil Company $10,000,000 as rebates on the oil carried by them, were you not? A. Yes, sir.

"Q. Look at that paper [handing paper to witness] and state whether you made an analysis—an examination of the testimony given by Mr. Cassatt, the Standard Oil Company people, and other railroad officers in that suit, in order to ascertain what the total amount of money paid over as dis-

crmination during that period of 17½ months was? A. I did."

The witness then presented a paper prepared by himself, which, if true, showed a rebate to the Standard Oil Company of 64½ cents per barrel on refined oil, 29 cents on crude oil from one district, 26½ cents on crude oil from another district, and 22½ cents per barrel on crude oil paid to the American Transfer Company. He added these figures, divided them by 3, and claimed 55 cents as the average rebate to the Standard. He then took the total consumption of oil from October 17, 1877, to March 31, 1879, to-wit, 18,556,277 barrels, and multiplying by 55 cents produced $10,155,218, which he claimed showed was the amount of discriminatory rebates paid to the Standard in 17 months.

Mr. Emery did not pretend to have any personal knowledge of the subject. He pretended to compile his figures from the evidence of Mr. Cassatt. That evidence is published in the same volume which contains Mr. Emory's evidence. To reach this result Mr. Emery had to make these absurdly false assumptions:

"I. That all oil consumed was shipped eastward over four trunk lines, and was all shipped by the Standard Oil Company.

"II. That all these trunk lines paid the same rebate as the Pennsylvania Railroad Company.

"III. That the shipments of oil of the class on which the rebate was 64½ cents was equal to the shipments of oil of the class on which the rebate was 26½ cents."

Eliminate these gratuitous assumptions from Mr. Emery's statements, and his conclusion is shown to be ridiculous.

These gratuitous assumptions are as nothing, however, compared to the gratuitous falsehoods embraced in the figures given. The claim is that a discriminating rebate, averaging 55 cents, was paid to the Standard Oil Company from October, 1877, to March 31, 1879, by four trunk lines.

The evidence of A. J. Cassatt which is referred for the truth of these statements, refers only to one trunk line, Pennsylvana railroad, and shows:

"I. That the Standard Oil Company shipped no oil over the Pennsylvania railroad until July, 1875. That the Pensylvania railroad was then interested in refining in competition with the Standard, and not only allowed the Standard no preferences, but discriminated against it to such an extent that the Standard stopped shipping over the road in March, 1877.

"II. That in October, 1877, the Pennsylvania railroad and the Standard entered into an agreement by which the Standard Oil Company was to have a commission of 10 per cent on all freight furnished by it in consideration of the Standard agreeing to equalize oil freights on the four trunk lines.

"III. That this agreement did not effect a discrimination even to that extent as against other shippers over the Pennsylvania railroad prior to May 1, 1878, because said shippers had contracts extending to that date, which were excepted in the contract with the Standard.

"IV. That the Pennsylvania railroad was willing and offered to carry oil for all shippers on the same terms with the Standard, excepting only 10 per cent commission, for which it demanded like considerations.

"V. That it did continue to carry for all shippers who did all their business over its line as low as for the Standard commission included.

"VI. That shippers not using the Pennsylvania railroad were able after May 1, 1878, to get oil east by the Erie canal lower than by rail, and shipped their oil by that route, in consequence of which the Pennsylvania railroad shippers were paying greater freight rates than other shippers.

"VII. In consequence the Pennsylvania rate was reduced to those who continued to ship by that line 44½ cents on refined, making the net rate $1, said 44½ cents being paid as rebate.

"VIII. For the same reason, namely, to meet canal rates, in July, 1878, the rate to those who shipped by rail was further reduced 20 cents, the 20 cents being paid as a rebate, and refunded back to May 1, 1878.

"IX. That these rebates were paid to all shippers who shipped entirely by rail, and were for the express purpose of putting them on an equality with those who shipped by canal.

"X. The same is true of the rebate allowed on crude oil during the same period, except 10 per cent. paid to Standard and 22½ cents paid to the American Transfer Company, the latter being the pipe line's share of a through rate.

"XI. That the rebates which were paid from May 1, 1878, to equalize rail and canal shipments were discontinued December 8 of the same year, when the canal was closed.

"XII. All payments of rebates entirely ceased March 31, 1879."

The result of the testimony is that while there was an agreement for a 10 per cent. commission between the dates referred to, there was in fact no discrimination against shippers by the Pennsylvania railroad; that the rebates paid were paid to all shippers over the lines, and that they were paid to put shippers by that line on an equality with shippers by canal.

Q. (By Mr. Smyth.) You will make that a part of your testimony, will you? A. I will make that a part of my testimony, and I hope it will be in the record of the proceedings of this commission as simple final answers to these lusty old lies about the $10,000,000 rebates.

Q. (By Representative Livingston.) You say now, in your place as a witness, that there never have been any rebates in favor of the Standard Oil Company? A. I am proceding with the statement.

Q. I understand you deny everything that has been said here before about rebates? A. I will go right into that and be glad to answer questions about that.

AS TO FAVORITISM IN BUYING LUBRICATING OILS.

Mr. Lee makes the statement that the railroad companies are now systematically robbed by their

own officers through the making of discriminatory contracts with the Standard Oil Company for lubricating oils. I had never heard of this allegation brought out here by Mr. Lee and some other witnesses until told before you. I want to deny it absolutely and entirely as being utterly untrue, and I challenge him to produce a scintilla of evidence in support of their allegations.

Q. (By Mr. Jenks.) Perhaps you will note that Mr. Lee says that he does not state that to be absolutely true, but it is a matter of belief with him. A. It is the same old method—he does not know it to be true, and he can not say it is true, and I challenge him to make any showing of any such thing at any place or any time.

Q. You say it is not true? A. I say it is not true.

NO DISCRIMINATORY RATES.

In answer to questions as to whether the Standard Oil Company is now receiving discriminatory rates, he does not answer directly, but goes back to the 1889 case, in which the Standard Oil Company was in no way involved; was not, indeed, in the case referred to by Mr. Lee and the same is true in a number of other cases also. It was not shown that there was any discrimination in favor of the Standard Oil Company, and as a matter of fact the Standard Oil Company were not given any such discriminatory rates. I make that answer more specifically with reference to the case of the period to which he referred, in answer to the testimony at that time.

Q. (By Mr. Smyth.) If there had been any such rates, you would have known it? A. I should have known it.

Q. It would have been impossible for any such rates to be in existence without your knowing it? A. It would. Further, the cases referred to in Mr. Lee's testimony as pending in the United States court to recover discriminations are really cases to recover freight which the railroad charged refiners on barrels. The Inter-state Commerce Commission decided that railroads carrying both in tank cars and in barrels should carry barrels free; and the railroads, refusing to accept such a decision, are testing the question in the United States court. It is fair to say that the same charge for carrying barrels was made against the Standard Oil Company, and if the refiners are successful in recovering, the Standard Oil Company will have a claim for a very large amount.

Q. (By Mr. Jenks.) Against the railroads? A. We shall be in the same position as the shippers if it is decided in the interest of the refiners.

Q. (By Mr. Smyth.) You will claim a rebate on the freight on the barrels of refined? A. Yes; we are in the same position as they are on that question. I may say, in my personal opinion, it is a most unjust decision for any court to make; but it is not for me to decide it.

In answer to inquiry as to whether the Standard Oil Company were paid rebates on shipments of other people, Mr. Lee answers in an untruthful and disingenuous way, and refers finally to the Rice case as the only possible support of his assertion. The Rice case will be fully answered in connection with the testimony of another witness.

THE STANDARD HAS STRICTLY OBEYED THE INTERSTATE COMMERCE LAW.

It is fair to say here, however, and I will make this statement covering the entire question of freight rates prior to the passage of the Inter-State Commerce law, in 1887, that the shipment of oil or any considerable freight over the roads was a question of special contract. While tariffs were nominally issued, every shipper knew that a special contract could be had, and it was universally the rule that special contracts were made for the shipment of any considerable freight. Since the passage of the Inter-state Commerce law we have strictly obeyed it. I want to say further in this connection that during the period before the passage of the Inter-State Commerce law every and any rate was uniformly considered in the fixing of prices at which the oil was sold. I want an exhibit—

Q. (Interrupting.) Are your books open to verify that statement? A. To the very utmost. I have thought it worth while, in view of the hard downing of this old ghost, to go into some considerable collateral proof to show the falsity of the charges in reference to discriminatory rates. I now beg leave to submit to you, and I of course will leave them with you—

Q. (By Representative Livingston.) (Interrupting.) If you will pardon me just now—is there a suit pending or anything of the kind on the part of the Inter-State Commerce Commission against the Standard Oil Company for rebates now, or has there been since the passage of the act? A. There have been various actions instituted regarding some special features of the carrying law, but I do not know that there are any now pending. I think they have all, so far as relates to our interest directly, been adjudicated.

Letters From Railroad Officers Denying That Their Roads Give Preferential Rates to the Standard.

I submit here in answer to direct queries—and they are only a small part of the entire number I might have for the asking—letters from prominent railroad officials representing the railroads in this country, North, South, East and West, answered on their own part and over their own signatures, with reference to the charge of discrimination in any way. These letters are of the most specific character on this subject. I thought it best not simply to rest on our own denial on the charge of discrimination, but to leave these with you as collateral evidence of the falsity of these statements which our enemies and competitors in the business are continually making on this question. I will, with your permission, read a list of these letters, and I will submit a map, colored in lines, showing

the different sections of the country reached by the railroads which are represented in these letters, and which deny any preferential relation with the Standard Oil Company.

[Standard Oil Company, 26 Broadway, New York]

Dear Sir: During May and June of this year the Industrial Commission (a body appointed by Congress) had a hearing in Washington. Before that body appeared a number of oil producers and refiners who testified, generally, that it was their belief that the railroads of the United States were giving the Standard Oil Company and its interests many advantages on its shipments of petroleum and its products as compared with those of other oil shippers.

We are now and have been, as you know, large shippers of petroleum and its products over your rails, and we would be glad if you would write me a letter stating as fully as you can whether or not, since the passage of the Inter-State Commerce law, you have in any way given to the Standard Oil Company or any of its representatives any lower rates of freight, either by direct tariff, rebate, under billing or in any way given to it or its representatives any advantages in the carriage of its shipments over your rails as against any other oil shipper. In other words, have not the Standard Oil Company and its interests paid the same rate per 100 pounds on its shipments, whether in tank cars, car loads, or less than car loads, as you have charged other shippers between the same points, and has there been since the passage of the Inter-State Commrce law, or is there now, any arrangement or device by which the Standard Oil Company have in any way received any advantage in the transportation of its oil, per 100 pounds, as compared with any other shipper over your road between the same points?

If you, yourself, have not full knowledge of the matter referred to, we would be glad if you would confer with your traffic department before answering. It may be that we will show this letter with your reply to the Industrial Commission, and we would like for your reply to be as full and explicit as possibly. Kindly reply at your earliest convenience, and oblige,

Yours, truly, HOWARD PAGE.

I will not weary you, unless it is your desire, by reading all of these letters, but I will read two or three of them. I will first read the list: Atchison, Topeka and Santa Fe Railway, Paul Morton, second vice president, Chicago, Ill.; Baltimore and Ohio Railroad, Oscar G. Murray, first vice president Baltimore, Md.; Boston and Maine Railroad, W. F. Berry, second vice president and general manager, Boston, Mass.; Chicago and Alton Railroad, C. A. Campbell, vice president and general manager, Chicago, Ill.; Chicago, Milwaukee and St. Paul Railway, A. J. Earling, second vice president, Chicago, Ill.; Chicago, Burlington and Quincy Railroad, Thomas Miller, general freight agent, Chicago, Ill.; Cleveland, Cincinnati, Chicago and St. Louis Railway, E. E. Cost, freight traffic manager, Cincinnati, Ohio; Delaware, Lackawanna and Western Railway, W. H. Truesdale, president, New York City, N. Y.; Erie Railroad, G. G. Cochran, fourth vice president, New York City, N. Y.; Great Northern Railway, D. Miller, second vice president, St. Paul, Minn.; Lake Shore and Michigan Southern Railway, W. H. Newman, president, Cleveland, Ohio; Louisville and Nashville Railroad, S. R. Knott, first vice president, Louisville, Ky.; New York Central and Hudson River Railroad, S. R. Callaway, president, New York City, N. Y.; Northern Pacific Railway, C. S. Mellen, president, St. Paul, Minn.; Pennsylvania Railroad, W. H. Joyce, freight traffic manager, Philadelphia, Pa.; St. Louis and San Francisco Railroad, D. B. Robinson, president, St. Louis, Mo.; Southern Pacific Company, J. C. Stubbs, third vice president, San Francisco, Cal.; Southern Railway, J. M. Culp, traffic manager, Washington, D. C.; Union Pacific Railroad, H. G. Burt, president, Omaha, Neb.; Wabash Railroad, S. B. Knight, general freight agent, St. Louis Mo.; Western New York and Pennsylvania Railroad, E. T. Johnson, general freight agent, Buffalo, N Y.

I will read, if you please, first as representing the different sections of the country, a letter from the New England states, Boston and Maine Railroad:

[Boston and Main Railroad, Traffic Department.]

Boston, Mass., August 18, 1899.

Dear Sir: Replying to your esteemed favor of the 15th instant, you ask me to state whether or not since the passage of the Inter-State Commerce law the Boston and Maine Railroad have in any way given to the Standard Oil Company, or any of its representatives, any lower rate of freight either by direct tariff, rebate or underbilling than has been openly quoted to all other shippers of oil, and I am pleased to be able to state that we have not.

Yours truly, W. F. Berry,
Second Vice President and General Traffic Manager.

Mr. Howard Page,
26 Broadway, New York, N. Y.

[Chicago and Alton Railroad Company, C. A. Chappell, Vice President and General Manager.]

Chicago, Ill., August 17, 1899.

Dear Sir: I take pleasure in stating to you, as I have frequently stated to others, and am willing to state before the Inter-state Commerce Commission or any other authority, that in my judgment the Standard Oil Company has obeyed the Inter-State law better than any other large shipper in the country.

So far as the Chicago and Alton is concerned, the Standard Oil Company has not only declined to accept concessions of any name or nature, but has used its influence with the railroads to maintain

agreed tariff rates, and there has been no arrangement, device or any other plan by which the Standard Oil Company received less rates than other shippers. The rates granted the Standard Oil Company have been the same that all other oil shippers have had, whether in tank cars, car loads or less than car loads.

I have frequently stated to the Inter-State Commerce Commission and to others that if all the large shippers of the country would co-operate in the enforcement of the Inter-State Commerce law, as the Standard Oil Company has done, we would have an ideal condition.

Yours very truly, C. A. Chappell,
Vice President and General Manager.

Mr. Howard Page.
Standard Oil Company, New York.

[Louisville and Nashville Railroad Company, office of the First Vice President.

Louisville, Ky., August 19 1899.

Dear Sir: Please refer to your favor of the 15th instant

Having been since January, 1888, in one position or another, charged with the direct supervision of the traffic affairs of the Louisville and Nashville Company, and having been for several years prior to that time directly connected with that department of the company's business, I feel I am in position to speak most authortatively upon the subject mentioned in your letter.

I beg to say that the Louisville and Nashville Railroad Company has not in any way given the Standard Oil Company, or any of its representatives or allied interests, any lower rates of freight, either by direct tariff, rebate, refund underbilling, or any other subterfuge or device, than it was at the same time extending to any and all other shippers handling the same or similar traffic and subject to the same rules, regulations, and conditions. In other words, the Standard Oil Company has been required to pay and has paid to the Louisville and Nashville Railroad Company the same charges for the same transportation rendered as any other shipper, and there is no arrangement between it or any of its agents and the Louisville and Nashville Railroad Company by which any advantage accrues to it over any other shipper handling similar traffic between the same points over this company's rails.

Yours truly,
S. R. Knott,
First Vice President.

Mr. Howard D. Page,
Standard Oil Company, New York.

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[The Atchinson, Topeka and Santa Fe Railway System, Great Northern Building, 77 Jackson street, Chicago, second vice president's office.]

August 17, 1899.

Gentlemen: It is with a great deal of pleasure and satisfaction that I write you in regard to the general belief that the railroads of the United States are giving the Standard Oil Company and its interests many advantages on its shipments of petroleum and its products as compared with shipments of other oil producers.

For nearly four years I have had charge of the freight business of this company, and never in all that time has the Standard Oil Company's representatives asked for, or received, better rates than other shippers of oil secure. From my own experience I know the Standard Oil Company does not ask for rebates, and I know further that the chief aim of the freight representatives of your company has been to have the railroads of the West absolutely maintain the tariff. I wish that other large shippers would take the same position in regard to this matter that your company does. If the terrible pressure from gigantic shippers for inside rates could be relieved the transportation problem of the country would be a very easy one to solve.

The position of your company in not asking for special rates, and in declining to receive rebates, and its efforts to keep the rates on oil and its products up, has been a common topic of discussion among western traffic men ever since the inter-state commerce law became enacted.

I take this occasion to thank you, on behalf of the railroad I represent, for the broad-gauged position that you have taken in this matter.

Yours truly,
Paul Morton,
Second Vice President.

Standard Oil Company,
New York City.

[Great Norhern Railway Company, office of the second vice president.]

St. Paul, Minn., August 23, 1899.

Dear Sir: Replying to your favor of the 15th instant, I herewith hand you a letter from our general traffic manager, Mr. F. B. Clarke, under date of the 21st instant, which, I think, covers your inquiry fully so far as this company is concerned.

I have no hesitancy in stating that since my connection with this company, in November last, the Standard Oil Company have paid the full legal tariff on all shipments made by it over this line, and there have been no arrangements by which any less rates were secured.

I can also make the same statement with regard to the shipments of the Standard Oil Company over the Missouri, Kansas and Texas Railroad during my connection with that road, from May, 1893, to

November, 1898.

If there is any further information desired, kindly advise and I will take pleasure in furnishing same.

Yours truly,

D. Miller,
Second Vice President.

Mr. Howard Page,
Standard Oil Company, New York City.

[Great Northern Railway, traffic department.]

St. Paul, Minn., August 21, 1899.

Dear Sir: Referring to the inclosed inquiry from the Standard Oil Company with respect to the rates charged on shipments forwarded over the Great Northern Railway since the passage of the inter-state commerce law.

My connection with this company dates from December, 1896, since which time I know personally that the Standard Oil Company has paid our company full tariff rates on all shipments we have carried for them. I have made inquiry of those connected with the general freight department who were in the service prior to my connection with the company and who have had opportunities to know what rates were being charged on the shipments of the Standard Oil Company, and have received assurances that the Standard Oil Company has always paid our company the full published tariff rates on their shipments, and that we have yet to receive the first intimation that the Standard Oil Company desired less than the published tariff rates charged other shippers of the same class of goods.

Yours truly,

F. B. Clarke,
General Traffic Manager.

Mr. D. Miller,
Second Vice President.

[Erie Railroad Company, 21 Cortlandt street, New York.]

August 29, 1899.

Dear Sir: In answer to your letter of the 15th instant to President Thomas, I desire to say, in his absence, that the Standard Oil Company has evinced the strongest disposition to co-operate with the railroad companies to the extent of paying fair and reasonable rates for transportation of all its products based upon and in conformity with the inter-state commerce act, and based on my own knowledge and information obtained from other officers of this company that said Standard Oil Company has not been afforded lower rates of freight upon such traffic than the tariffs open to and offered for the carriage of like products between the same points to any other shippers of oil over this company's lines.

Yours truly,

Geo. G. Cochran,
Fourth Vice President.

Mr. Howard Page,
26 Broadway, City.

[Delaware, Lackawanna and Western Railroad Company, office of president.]

August 22, 1899.

Dear Sir: I noted with some interest that during a hearing before the Industrial Commission in Washington during May and June of this year certain parties appeared before that body who testfiied in a general way that they believed that the railroad companies of the United States were giving the Standard Oil Company, or its interests, many advantages on its shipments of petroleum oil and its products over those accorded other shippers of similar commodities.

These statements or this testimony, if it may be so considered, is so much at variance with the facts and the truth as I know them to be that I feel compelled to write you and state the facts as I know them to exist, and to say that I am willing you should make such use of this letter as you may desire in refuting false statements referred to.

This company has not since the passage of the inter-state commerce act, so called, given the Standard Oil Company or any of its interests or anyone for it any reduced rates or advantages of any character whatever on its shipments of petroleum oil and its products different or in any way more favorable than was at the same time accorded other shippers of similar commodities. As I am advised by our people, no one for the Standard Oil Company has since the passage of said act ever solicited any concession in any way, shape, or form from the regular, established rates, rules, and regulations governing the transportation of petroleum oil and its products.

Furthermore, I take pleasure in certifying that at the time of the passage of the inter-state commerce act and until 1894 I was in charge of the Minneapolis and St. Louis Railway, and from 1894 until 1899 was vice president and general manager of the Chicago, Rock Island and Pacific Railway Company in charge of is freight traffic; that during my connection with the Minneapolis and St. Louis and the Chicago, Rock Island and Pacific railways, as aforesaid, neither of these companies ever granted to the Standard Oil Company or anyone in its interests or for it any concessions from the regular, established rates on its shipments of petroleum oil and its products, nor did any official of the Standard Oil Company, or anyone else in its interests, ever ask special rates or advantages on its shipments, as

against those accorded those of other shippers of the same commodities.

Should it be found necessary or desirable to have the foregoing statement of facts put in the shape of an affidavit or deposition I shall be very much pleased indeed to put my knowledge of this matter in that shape and place at your disposal for such use as you may deem best.

Yours truly,
W. H. Truesdale,
President.

Mr. Howard Page,
Standard Oil Company, 26 Broadway, City.

[Cleveland, Cincinnati, Chicago and St. Louis Railway Company.]

August 28, 1899.

Dear Sir: I have your letter of the 15th in relation to certain testimony that was given before the Industrial Commission during May and June of this year regarding shipments of petroleum and its products.

If I mistake not, this company is the recipient of a fair share of the traffic shipped by your company in all directions, and we can most positively state, and are prepared to support the same by an affidavit, that we have not, since the inception of the inter-state law, paid the Standard Oil Company or any of its agents or branches in any manner, shape, or form, one mill for the purpose of influencing business via our line, and that the Standard Oil Company have paid full tariff rates on all shipments over the line of the Cleveland, Cincinnati, Chicago and St. Louis Railway, whether in tanks, carloads, or less than carloads.

I do not know what further I can say on this subject, only that if the other large shipping interests would pursue the same policy as the Standard Oil Company in relation to the strict maintenance of published rates, it would eliminate the strife and contention among the railroad companies which often produces unhealthy competition and ruinous rates.

Very truly yours,
E. F. Cost.

Mr. Howard Page,
26 Broadway, New York.

[Chicago, Milwaukee and St. Paul Railway Company, office of second vice president.]

Chicago, August 18, 1899.

Dear Sir: In the absence of President Miller your letter of the 15th instant has been handed me. In reply I desire to say that since the passage of the interstate commerce act the Chicago, Milwaukee and St. Paul Railway has carried a satisfactory share of the business of the Standard Oil Company to all competitive points reached by its lines, and I also desire to say that the full, lawfully published tariff rates have at all times been exacted, and that no concessions or deviations from such lawfully published rates have ever been granted by this company in any manner or by any device whatsoever; nor has the Standard Oil Company asked for any concessions or suggested any deviations from the lawfully published tariffs. I wish, further, to state that there has been no discrimination practiced by this company in connection with the business of the Standard Oil Company and that of other shippers of petroleum and its products.

Yours truly,
A. J. Earling,
Second Vice President.

Mr. Howard Page,
Standard Oil Company, 26 Broadway, New York City.

[Chicago, Burlington and Quincy Railroad Company, general freight department.]

Chicago, August 22, 1899.

Dear Sir: Answering your letter of the 15th instant, I have to say that there never has been a request made by anyone representing the Standard Oil Company since the passage of the inter-state commerce law for a reduction in our tariff rates, directly or indirectly, either by tariff, rebate, underbilling, or otherwise and no concessions have been made by this company of any character whatsoever on the business transported by us for account of the Standard Oil Company. It has all been done at published tariff rates, which are open to the inspection of everybody.

Yours truly,
Thos. Miller,
General Freight Agent.

Mr. Howard Page,
Standard Oil Company, New York City.

[The Baltimore and Ohio Railroad Company.]

Baltimore, Md., August 22, 1899.

Dear Sir: Replying to your favor of August 19, in relation to rates charged to and collected from the Standard Oil Company on their shipments of oil over the road, we invite your attention to next-attached communication from our manager freight traffic, Mr. Wright.

With reference to the Cleveland, Cincinnati, Chicago and St. Louis road, as you know, it has been a number of years since my connection with that company was severed, and it is therefore sug-

gested that you take the matter up direct with them.

Yours, very truly,
Oscar G. Murray,
First Vice President.

Mr. Howard Page,
Standard Oil Company, New York, N. Y.

[The Baltimore and Ohio Railroad, office of manager of freight traffic.]

Baltimore, August 21, 1899.

Dear Sir: With the return of attached letter from Mr. Howard Page, of the Standard Oil Company, would advise that since the inter-state commerce law became effective the Baltimore and Ohio Railroad has not to my knowledge given the Standard Oil Company or any of its representatives any rate less than published tariffs on oil, whether in tank cars or barrels or by any subterfuge whatever, all such tariffs being filed with the commission and the rates named therein being applicable on all shipments, whether made by the Standard Oil Company or its competitors.

Yours truly,
C. S. Wright,
Manager Freight Traffic.

Oscar G. Murray, Esq.,
First Vice President.

[Western New York and Pennsylvania Railway Company, general freight department, Mooney-Brisbane building.]

Dear Sir: I am in receipt of your letter of 22d instant relative to testimony given by Oil Creek producers and refiners before the Industrial Commission in Washington.

In reply to your letter would say that on any shipments of petroleum or its products forwarded by the Standard Oil Company, from or via Western New York and Pennsylvania Railway, the Standard Oil Company have not and are not obtaining any advantage in any way, shape, or manner as compared with other shippers of petroleum and its products. The shipments of the Standard Oil Company are charged exactly the same rates and the same weights as the shipments of any producer or refiner between the same points, and no lower rates are given the Standard Oil Company, or to any of its representatives, or through any other party, either through tariff, rebate, underbilling in quantity or in weight, through any device whatever; and the charges on such shipments against the Standard Oil Company have been upon exactly the same basis between the same points as charged any other refiner or producer since the inter-state commerce law was put in force.

If it is desired I am willing to appear before any United States commissioner in Buffalo and make affidavit to the above facts.

Yours truly,
Edward T. Johnson,
General Freight Agent.

Mr. Howard Page,
26 Broadway, New York City.

[The Wabash Railroad Company.]

St. Louis, August 18, 1899.

Dear Sir: I note that in the course of the investigation before the Industrial Commission, during May and June of this year, evidence was submitted to the effect that the Standard Oil Company had received advantages in the shipment of petroleum and its products as compared with other oil shippers.

I do not understand that specific reference was made to any railroads thus favoring the Standard Oil Company, but I would like to testify in defense of the Wabash Railroad Company that we have not contributed in a discriminatory manner to the Standard Oil Company, and that we have not since April 5, 1887—when the inter-state commerce law became effective—deviated from our published tariffs in the way of rebates or irregular departure from said tariff in a single instance in the handling of shipments of the Standard Oil Company. We have had but one tariff, which applies alike to all oil shipments handled by the Wabash Railroad Company, from that period up to the present time.

Yours truly,
S. B. Knight,
General Freight Agent.

Mr. Howard Page,
Standard Oil Company, 26 Broadway, New York.

[Union Pacific Railroad Company, office of the president.]

Omaha, Nebr., August 25, 1899.

My Dear Sir: Returning to Omaha after an absence, I find your letter of the 15th instant.

In reply permit me to say that as far as my personal knowledge is concerned, and from all information I am able to obtain from other officers of this company, the Standard Oil Company has at all times since the passage of the inter-state commerce act evinced the strongest disposition to co-operate heartily with the railroads to the extent of paying fair and reasoneble rates for transportation of all of its products. I am unaware that the Standard Oil Company has been in any manner afforded lower rates of freight than the tariffs open to and

offered for the carriage of like products for any other shippers of oil over this company's lines.

Yours truly,
Horace G. Burt, President.

Mr. Howard Page,
Standard Oil Company, New York City.

[Northern Pacific Railway Company, office of the president, St. Paul, Minn.

New York, August 23, 1899.

Dear Sir: In reply to your favor of August 15, I take pleasure in saying that so far as the Northern Pacific road is concerned it has not in any way allowed you any rebate or concession on your shipments of oil as compared with any other shipper of oil between the same points; and there is no arrangement or understanding, expressed or implied, by which you receive any concession or consideration not open to every other shipper of the same commodities between the same points upon our line.

The same is also true, so far as I can recall, with regard to the relation of your company with the New York, New Haven and Hartford Railroad, during the time I was connected with the same as second vice president in charge of its traffic.

Yours truly,
C. S. Mellen, President.

Mr. Howard Page,
26 Broadway, New York City.

[Southern Railway Company, office of the traffic manager.]

Washington, D. C., August 21, 1899.

Dear Sir: Replying to your favor of the 15th instant: Since the organization of the Southern Railway Company I have been in charge, as traffic manager, of its traffic interests, including the establishment and promulgation of all rates used by it in the transportation of passengers and freight over its line of railway, and I am prepared to say, unhesitatingly and without qualification, that the Southern Railway Company has at no time given to the Standard Oil Company, or any of its representatives, any lower rates of freight in the carriage of shipments made by that company over our rails, either by direct tariff, refund, or otherwise, than to any other shipper of similar commodities.

Our rates, as issued from time to time, are published and filed with the Inter-State Commerce Commission, and with the several commissions of States traversed by the Southern Railway, and the Standard Oil Company has in no instance been given the benefit of anything less than the rates so published and filed with these commissions, and which are the same figures as are charged all other shippers of petroleum and its products.

The policy pursued by the Southern Railway Company is to treat all of its patrons alike, and to fully observe its obligations under the law, and this policy applies as well to shipments of petroleum as to other classes of freight between points on our line.

Yours truly,
J. M. Culp, Traffic Manager.

Mr. Howard Page,
26 Broadway, New York City.

[St. Louis and San Franci :o Railroad Company.]

St. Louis, Mo., August 25, 1899.

Dear Sir: Absence from home has prevented an earlier reply to yours of the 15th instant.

Since the passage of the inter-state commerce law there has been no time that the Standard Oil Company, or any of its subordinate companies, have enjoyed any lower basis of rates on the business handled by our line than that which has been charged all other oil companies doing business with us. This statement is made absolutely, and without qualifications of any kind or character.

In all our dealings with the Standard Oil Company we have found it to be the rule that they have never in any instance asked us for any lower basis of rates than was enjoyed by any other company.

Yours, very truly,
D. B. Robinson, President.

Mr. Howard Page,
Standard Oil Company, New York City.

[Southern Pacific Company. Office of the third vice president.]

San Francisco, August 23, 1899.

Dear Sir: I am in receipt of your letter of August 15, in which you refer to the Industrial Commission which recently met in Washington, and before which appeared a number of oil producers and refiners, who testified generally that it was their belief that the railroads of the United States were giving the Standard Oil Company and its interests many advantages on its shipments of petroleum and its products as compared with those of other oil shippers.

I respond to your invitation to state the facts bearing upon this question in its relation to the Southern Pacific Company, not only because I believe the Standard Oil Company is entitled to it, but I believe it is my duty to my own company and to the railroad interests of the United States that these facts should be published.

Since the passage of the inter-state commerce

law, the Standard Oil Company has not solicited nor received from the Southern Pacific Company any lower rate of freight for the transportation of oil or of the products of petroleum, or anything else in which the Standard Oil Company deals, than the lawful, published tariff rates, which at the same time were given to every other shipper of like commodities for similar and contemporaneous service, nor has the Standard Oil Company, in its use of the transportation lines of the Southern Pacific Company, employed any device such as misrepresentation of the contents of packages or cars or underbilling in weights in order to avoid the tariff or to gain advantages over its competitors. I say that the Standard Oil Company has not employed these devices because it has not been detected in any such attempts, and our system of inspection has been such that I do not believe such attempts could have escaped detection. In other words, according to my observation and experience, and I have full knowledge of its transactions with the Southern Pacific Company, the Standard Oil Company has obeyed the law in its spirit as well as letter.

Yours truly,
J. C. Stubbs,
Third Vice President.

Mr. Howard Page,
Standard Oil Company, 26 Broadway, New York.

[The Lake Shore and Michigan Southern Railway Company.]

Dear Sir: Replying to your favor under date 15th relating to rates charged Standard Oil Company on traffic as compared with charges on similar traffic from other shippers.

The Lake Shore Company does not now, and has not heretofore, so far as can be ascertained from the records for a period of years, charged the Standard Oil Company any less rate per hundred pounds on its property, whether oil or products, in tanks or barrels, carloads or less, than charged to the trade in general on such property; in other words, the Standard Oil Company has not received any lower rates on the vast traffic handled by that company than other shippers of the same commodities, regardless of quantity.

I would further state that the Standard Oil Company, nor its representatives, have at any time asked that we give them any form of concession, but on the other hand, have insisted that the full authorized tariff rates be charged on its shipments, and that all other shippers of similar commodities be treated likewise.

The conditions in that respect do not differ from the practice during the time I was connected with the Chicago and Northwestern Railway, as the Standard Company insisted then, as it does now, on application of the tariff rates on all shipments of petroleum and its products.

Very respectfully yours,
W. H. Newman, President.

Mr. Howard Page,
Vice President Standard Oil Company, New York City.

[New York Central and Hudson River Railroad Company, Grand Central Station.]

New York, August 28, 1899.

Dear Sir: Referring to your letter of the 15th instant you may state explicitly, for this company, and also for the Lake Shore and Michigan Southern Railway Company, of which I was president and am now a director, that no discrimination in the matter of rates has been, since the passage of the interstate law, extended in favor of the Standard Oil Company over either of these lines. So far as my knowledge goes, no application has ever been made by any of the officers of the Standard Oil Company for any discriminating rate.

Yours truly,
S. R. Callaway, President.

Mr. Howard Page,
The Standard Oil Company, New York City.

[Pennsylvania Railroad Company, General Office.]

Philadelphia, August 28, 1899,

My Dear Mr. Page: In reply to your inquiry, in which you call my attention to statements in the newspapers relating to the inquiry of the Industrial Commission, in which statements witnesses say that the railroad companies pay rebates to the Standard Oil Company and permit preferences by undergauging tank cars and by paying fictitious prices for oil supplies, I beg to say that if said assertions are meant to apply to this company, in its relation to the Standard Oil Company, they are wholly groundless and without foundation in fact.

Yours truly,
W. H. Joyce,
Freight Traffic Manager.

Mr. Howard Page,
26 Broadway, New York City.

NO PREFERENTIAL RELATIONS SINCE 1887—DISCRIMINATIONS INJURED THE STANDARD.

Q. (By Mr. Smith.) You state very plainly that there were no rebates or advantages in rates given to the Standard Oil Company. Have you been given any advantages with reference to quicker movement of

freight—immediate dispatch? A. None that I am aware of.

Q. You have not asked for any? A. We have not asked for any. I do not know of any such preferential arrangements.

Q. (By Mr. Jenks.) Is this a general statement you make that covers the entire period since the passage of the interstate commerce law? A. Yes.

Q. That the Standard Oil Company has in no way had any preferential relations in freights? A. That is my answer.

Q. Preferential relations would seem to cover it? With reference to the period immediately preceding that, you state that before that time for some years the freight rates to all large shippers were made by special contract, and that you did have special rates then? A. Yes.

Q. Did I understand you to say further that so far as the Standard Oil Company was concerned the prices to consumers were based upon freight rates in part, so that consumers received the benefits of any benefits you had? A. I make that statement very broadly.

Q. You make that statement very broadly, then, that the Standard Oil Company did not receive any benefit in preferential rates? A. On the other hand, I think the old system in vogue among the railroads prior to the passage of the interstate commerce law was altogether contrary to the interests of the Standard Oil Company. I repeat again that the greatest prosperity has come since the passage of the interstate commerce law.

Q. (By Representative Livingston.) In your answer a moment ago you said, "Not in any way covered by interstate commerce law." Are you getting rebates in any way not covered by this law? A. We are not. There may be local shipments, as between some points within a state where tariffs are not issued, that I am not familiar with at all, but not to my knowledge in any way that would debar any other shippers in the same business, if there was another shipper there, having the same thing.

Q. There is some specific testimony that in some place on the Pennsylvania Central, between two given points, the charge on a tank of oil was $1.80 and that the Standard Oil Company got, or the railroads gave back, the 80 cents and put the $1 into their treasury, and with the independent company kept the whole $1.80? A. I do not know of any such case.

Q. Would that be a violation of the interstate commerce law? A. If within the State it might not be; but I have never heard of any such case as you say.

Q. You say they charge them all the same rates? A. Every shipper could have had the same thing. To my own knowledge I do not know of the case you specially refer to.

Q. (By Mr. Farquhar.) Are there not many railroads not under the interstate commerce law whose lines are within a State, and which are not in the interstate commerce business? A. There may be, but I do not know. I do not know, on our part, of any arrangement that would be exclusive in connection with any such railroad, if there be such.

Q. (By Mr. Jenks.) Have you any further reference to make to this freight question? A. I think that is all.

Q. (By Mr. Kennedy.) In one of these letters your correspondent spoke of your policy in refusing rebates. Have any of the railroad companies offered the Standard Oil Company rebates in consideration of securing their business? A. Well, that would be a very difficult question for me to go into. That the Standard Oil Company during the past 10 or 11 years, since the passage of the interstate commerce law, have not secured large amounts of rebates is true; but that they may have been offered rebates at times is undoubtedly true; but I have no specific cases to state. It is one of our duties to keep looking after our competitors a little bit, and we are so shining a mark we could not if we were so disposed, but we would not, even if we could and if we were desirous, which we are not.

Q. (By Mr. Smyth.) You state positively that you did not accept them in general and have not accepted them? A. We have not and do not expect to accept them.

Q. (By Mr. Jenks.) Your statement applies also to your shipments within a State? A. Yes; and I speak of them in a general way—that we have no rates that would debar any other shippers from the same basis.

Q. (By Mr. Farquhar.) Under the old rule of special contracts, is it or is it not a fact that the Standard or any other great company never needs to solicit special contracts from great roads, but that the railroads, competing among themselves, offer the shipping contracts and then cut below their original contracts themselves? A. Unquestionably.

Q. That was the character of all traffic business before the interstate commerce bill? A. It was.

Q. (By Mr. Smyth.) That was proved by the case of the Pennsylvania railroad you have spoken of when you shipped by the Erie canal? (Question not answered.)

Q. (By Mr. Phillips.) Do we understand you, Mr. Archbold, that large shippers never solicited low rates—that they were always solicited on the part of the railroads? A. I answered that question by saying that a business as large as ours is sought for by railroads. I do not say other shippers do not solicit rates; I have no doubt they secure them.

Q. (By Mr. Jenks.) In one of the letters you read a statement was made to this effect—that the Standard Oil Company, by not asking for rebates and adhering strictly to the established or published freight rates, had aided in keeping the freights up. Is it your opinion that the railroads generally speaking, feel that the Standard Oil Company is aiding them in keeping their freights up, so as to make them good paying railroads? A. That is true, and the railroads will say so if they are frank enough to say so. Any of you who have contracts with the

great railroads of the country, if you will talk with them on that subject, will find that to be the case.

Q. (By Mr. Phillips.) How will keeping the rates up affect the general public? Is that in their interest? A. It is to the interest of the general public to have a uniformity of rates under the interstate commerce law, as the public consider it.

Q. (By Mr. Smyth.) You are in favor of the interstate commerce law? A. I am, most decidedly.

Q. (By Mr. Ratchford.) Mr. Archbold has made himself very clear, I think, on the question of rebates on the shipments of the Standard Oil Company. We have received specific testimony to the effect that the Standard Oil Company received rebates from the shipments of other companies. What do you know of that? A. I will treat on all that matter later, if you will allow me.

THE CONSUMER GOT ALL REBATES AND MORE.

Q. (By Mr. Phillips.) You stated, if the chair remembers, that since the passage of the interstate commerce law your profits have been greater than they were prior to that. Now, was that due to the passage of the interstate commerce law, or on account of the larger business and less competition? A. Well, I think that one of the causes—a number of causes may have combined in the growth of the business—but one of the causes is the better settled condition of the business incident to the passage of the interstate commerce law. I think that my assertion that the consumer was given cut rates of freight is not only true, but that the effect was greater than I have stated it; for in the strain, the anxiety that the manufacturer was necessarily under lest his neighbor, his competitor, might get a lower rate than he was getting, they were always all very anxious sellers of oil. I think that oftentimes the price was made lower than it needed to be because of the belief or expectation that lower rates of freight were either prevailing or might prevail. I think the business was sacrificed on that account.

Q. But you do not wish to leave the impression that your greater income or greater profits are due to the interstate commerce law? A. Oh, no; business has grown.

Q. And competition has not been so great? A. Oh, I think competition has been quite vigorous.

PRICES OF REFINED OIL IN NEW YORK, AND OF CRUDE IN 1896.

Mr. Lee made the statement, as to the course of prices for domestic refined oil for New York, or Greater New York, during the period from March, 1896, to July, 1898, I think it was, that the Pure Oil Company, the company with which he is related, having made its advent in the market of Greater New York, in March of 1896, found the price which we were charging to the people of that great metropolis to be 9½ cents a gallon, and that because of their advent and of their supposed competition we dropped the prices on them until July of the same year it was 5½ cents. He spoke of this not only as illustrating our method of attack as against the competitor, but, I believe, claimed some credit from the people of Greater New York to the Pure Oil Company because of their advent there. I will read from the list prices of the period named as they prevailed at the time and show that, to all the trade in Greater New York and its vicinity, in March, 1896, our selling price averaged for the month 7.98 cents as against his statement of 9½ cents.

Q. In that immediate territory? A. In that immediate territory.

Q. (By Mr. Phillips.) Was that immediately before or at the time of the advent of the Pure Oil Company? A. Their advent there was in March, according to his statement.

Q. Can you give us the statement of the month prior to that? A. I made it only for the period covered by him in his testimony. I can give you the other. And I will also quote from that statement as showing the relation between the two—the crude oil prices as they prevailed. In March the average price of crude oil per barrel of 42 gallons at the well was $1.42. In April our price was 7.31 cents, the average price of crude oil being $1.22. In May the average price of refined was 6.94 cents and the average price of crude was $1.14. In June the average price of refined was 6.72 cents and the price of crude $1.15. In July the average price was 6.23 cents and the price of crude $1.09. It is only an illustration of the carelessness which marks the statements which our competitors make, with reference to any feature of the business in which they want to make a point.

Q. (By Mr. Phillips.) One question there; did you sell any oil in March as high as 9 cents? A. I give the average prices.

Q. Was there any other selling price? A. I should say not, because there could not be an average of that.

Q. It could be sold at 10 or 11 cents in the beginning and three or four cents at the close? A. The following month would show that.

ANY GREAT VARIATION IN PRICE IN ANY LOCALITY WOULD BE SPEEDILY KNOWN AND WOULD BE DISHONEST.

Q. (By Mr. Jenks.) You give these average prices for Greater New York. The statement has been made at different times that it is your habit in dealing with the customers of competitors to find out the individual customers and make special cut rates to them. It might easily be, therefore, that your average price would be what you have given, and that to a good many special customers, with whom the Pure Oil Company was trying to deal it would be 5½ cents. A. I can not make any definite statement, but I would reply that it would be utterly impossible for us to have any great variation in price to any special customers in any locality. It would be speedily known and it would be dishonest, and I want to say that dishonesty will

not win in any business. We have got our hold on the trade in 30 years because we treated the trade honestly and not dishonestly.

Q. You would be safe in saying that in March, 1896, no oil was sold to any customer for less than 6 or 6½ cents? A. Oh, not for less than 6¾.

RAILROADS VS. U. S. PIPE LINE—NO FIGHT OF THE STANDARD'S.

Mr. Lee makes a statement regarding the difficulty of his pipe line, the United States Pipe Line, in crossing railroads and securing right of way to the seaboard, and makes a general statement implying that we have instituted and carried out great obstructions to their progress. I want to make a general denial of this statement. We have not at any time had any different relations with reference to any obstrcution of their line than would attach to any competitor in a line of business engaging against another. With reference to the special features referred to by Mr. Lee, and which he attempts, by implication at any rate, to connect us with, in the crossing of the Delaware and Lackawanna railroad in New Jersey, I want to say that the contention in that respect was entirely in the hands of the railroad, and not at our hands in any possible respect. They went there surreptitiously and endeavored to force their way, on a Sunday, over a line where they had no right, either by private purchase or by public franchise. Having accomplished the crossing of the road in that surreptitious way, they stationed there an armed force to prevent the railroad company from asserting its rights and taking out their lines, and kept that force there for a long period. The railroad went about it in a peaceful way, in the courts, and the final result is that the decision is against the line, after the case has been carried up finally to the supreme court of the state, and they must, of course, remove their line. But any statement on Mr. Lee's part, or any other witness, that we had anything to do with that matter, or with reference to any of the difficulties interposed in their progress to the seaboard is absolutely faise.

Q. (By Mr. Phillips.) Did your company own in fee simple the tract of ground, and was a roadway reserved by the landholder? Was that purchased by them? A. It was not my case, and I am not conversant with the details regarding it. The fact that after having been fought in the newspapers and in the courts for a term of years, seeking the sympathy of the judges as well as the public, the supreme court of the state has ruled against them is the best evidence, I think, that the right was against them. I want to say with reference to our pipe lines that we never endeavored to cross any man's right of way without first seeing him about it.

Q. Still did they not go through the railroad on their own ground, and was not this the final decision, that they had not the right to lay a pipe line where a man had reserved a right of way under the ground? A. It was not only decided that they had no right there, but they were ordered to move.

THE STANDARD NEVER HAD SO LOW A FREIGHT RATE.

I want to present a statement showing the rate of freight which Mr. Lee's United States Pipe Line enjoys from the Central Railroad of New Jersey on the crude oil and refined oil also transported over that line from the terminal point of their pipe line to the seaboard; it being a lower freight, I think, than the Standard Oil Company ever had for an equal distance at any time in the history of their business. (Witness here reads a letter from the Central Railroad of New Jersey.)

CENTRAL RAILROAD OF NEW JERSEY'S RATE TO UNITED STATES PIPE LINE, HAMPTON JUNCTION, N. J., TO BAYONNE, N. J.

(Distance, 52½ miles; mileage, ¾ cent each way, equals 78 cents per car; empty car returned free. Weight per gallon, crude oil, 6 2-3 pounds; refined oil, 6½ pounds.)

	Rate per barrel of 50 gallons	Actual wgt. per barrel of 50 gallons	Rate per 100 pounds	Rate per car of 120 barrels	Rate per car, less mileage
Crude ...	0.0692	333	0.0208	$8.20	$7.42
Refined ..	.0769	325	.02366	9.22	8.44

The above shows that this oil is being carried 52½ miles in tank cars, averaging 120 barrels or 20 tons to the car, at a gross average revenue to the railroad, on the crude and refined oil of $7.93 per car, and out of this revenue the railroad returns the empty car free.

The contract between the railroad and the pipe line is for 100 years from January 1, 1894, and provides for various rates from different points along the line of the Central Railroad of New Jersey to tidewater. The oil is now (and has been for three years) shipped from Hampton Junction, and the above rates are being paid.

The contract further provides the right upon the part of the Pipe Line Company to abrogate the arrangement upon five years' notice at any time during the 100 years. The railroad has no right to cancel, excepting for violaton of lease.

Q. (By Mr. Smyth.) The lease is on record? A. Yes; it would seem that if there ever was a preferential contract that is one of them.

Q. (By Mr. Jenks.) You say this is on record? A. It is not a lease; it is a contract.

Q. (By Mr. Phillips.) You do not assume to say that it is an illegal contract? A. I am not a lawyer; I am not passing upon the legality of the question.

EFFORTS TO BUY OUT THE INDEPENDENTS—ADVANCES FROM THE OTHER SIDE.

Mr. Lee claims at great length and with great particularity that we have at different times done

our best to buy them out, offering them large inducements in the way of extraordinary prices for their properties, and have done our best to get them out of the business by purchase. I want to say that any approaches on that line that have been made have come from Mr. Lee's side to us; and I want to say, now that he has forced the question, that approaches of that kind have been made by pretty nearly every person in connection with his company, including not only Mr. Lee, but Mr. Phillips, Mr. Nichols, Mr. Murphy, Mr. Jennings, Mr. King, and Mr. McDonald, and as I said, pretty much every gentleman prominent in the affairs of that company. I want to say further that we have persistently declined the considering of any such combination with them on the ground, first, as we have said to them at various times, of its illegality; and, second—and this would have been enough in itself—our unwillingness to enter into any business relations with them because of our lack of fath in them. We have had experience with the gentlemen, different ones of them, at different times, and we should have known if there had been no legal difficulty in the way of such combination that it was impossible for us to enter into any such relation with them. I am making the broadest possible denial to Mr. Lee's statement that we have gone after them with reference to their purchase or combination; and I am making in return a statement that they have up to this very day, within the period of your sitting here, approached us on this question.

Q. (By Mr. Phillips.) Do you mean to include all of them? A. I mean to include the gentlemen I have named and others I have not named.

Q. Have any persons or any agent or gentlemen from whom you bought property approached individual members coming direct from your office, to solicit the selling of an interest to you? A. No; I say broadly that the approaches have been made from your side, and the answer is as broad as I can make it.

Q. You have no knowledge of a person coming from your office after soliciting you to make a transaction with these people? A. I have knowledge of persons coming to our office who came there at the instance of different people in that connection to raise a question about it; you came there—many of them—if that is what you mean.

THE INDEPENDENTS PROPOSED A DIVISION OF THE BUSINESS.

Q. Was not that to have a stop put to the litigation that was going on in New Jersey and to have a right to live as a company? A. I do not know what you mean by that.

(By Mr. Rogers.)May I have the privilege of prompting Mr. Archbold?

(By Mr. Phillips.) Certainly, you have the privilege.

(By Mr. Smyth.) I think so, certainly.

(By Mr. Phillips.) Any information of that kind is entirely admissible.

(After talking with Mr. Rogers.) A. I answer broadly again, after conference with Mr. Rogers, that we have never sent anybody for any purpose.

Q. (By Representative Livingston.) Those propositions, were they written or verbal? A. Oh, no; they were all oral. You do not get that company into making written propositions; they are too crafty.

Q. (By Mr Phillips.) Do you say, Mr. Archbold, that you were approached by a large per cent of those persons in an unfair way? A. Oh, I did not be so; I do not say so. It may have been entirely fair and just in their view but their propositions, in our view, was illegal and not to be entertained.

Q. Was not that after you had purchased a large amount of stock, a controlling interest, in the Producers' Oil Company, Limited, and also purchased a large amount of the United States Company's stock, and was it not to make some fair, honorable and just contract that would leave these companies the privilege of living and doing business years ago when they were very badly crippled by opposition from the Standard Oil Company, by the lowering of prices of oil in Europe and other places? A. Using your own case, Mr. Phillips, as an illustration—and you can hardly find fault with that—I do not think that at the time you came to Mr. Rogers or myself you raised any question whatever with reference to any possible minority ownership in any of these companies. What you and they proposed was simply that a division of the business be made so that you would have a percentage and we a percentage, in order to co-operate in the marketing of the oil and in all that pertained to the welfare of the business; is it not so?

Q. Was it not to get the privilege of handling the capacity of the lines then existing and to cease further opposition and to do away with the opposition which was very badly crippling these companies; and had you not at that time lowered the price of oil in Germany so as to make it entirely unprofitable to the refiners? They lost very large sums of money and you had bought out a per cent. of the refineries that were engaged in these independent lines? A. Nothing of the kind existed. Our business was entirely satisfactory, so far as I am aware; and we had no special desire that a combination should be made, as is evidenced by the fact that we were unwilling to entertain it. And I now further state that we were unwilling to entertain it not only because of its illegality, but because of the lack of faith in the individuals connected with it. There can be no question about that.

Q. Well, do you know that at that time a Mr. Poth was managing the business of the independent refiners in Germany? Did he not sell out to the Standard Oil Company the tankage procured in Germany, so that these companies could not do business? Did they not have to re-establish connections and send agents there, and build tankage in which their oil could be received and distributed in Germany? For a number of years did you not put the prices there so that there was no profit? And during that period did not you buy out some of the

largest refineries that were connected with these companies? A. My answer, Mr. Phillips, broadly, is that none of these questions have anything to do with this company, with that proposition. You came to us seeking these propositions. That is my statement and you dare not deny it. That is true, every word of it.

CHARACTER OF MEN PROMINENT IN THE STANDARD.

In answer to the query regarding gentlemen prominent in the Standard Oil Company, Mr. Lee saw fit to speak of them in a most depreciatory way. It is not amiss for me to ask these gentlemen to think for a moment of J. D. Rockefeller, William Rockefeller, H. M. Flagler, William G. Warden, Charles Pratt, J. W. Bostwick, Benjamin Brewster, Henry H. Rogers, W. H. Tilford and James Magee, and I might mention scores of others prominent in the Standard Oil connection, whose business genius and boundless energy have been given to the building up of the petroleum industry. Will you think of these gentlemen in comparison with the men who have appeared here to defame them? I might go further and speak of the beneficent use these gentlemen are making of their substance, but they require no eulogy at my hands.

In answer to the query as to what would be the effect if the Standard Oil Company were abandoned or dismantled, Mr. Lee said that the prices of refined products would go lower all over the world. I will not occupy your time by any lengthy argument in refutation of this most absurd proposition, that if we were really out of existence and put out of existence that which represents today two-thirds or three-fourths of the active capital, energy and equipment employed in the manufacture and distribution of oil, the prices would go lower; but I will call your attention to what Mr. Lee says in practically the same breath, as showing his utter inconsistency. He gives it as his opinion that if the Standard were out of the way prices would be lower, and in the same breath testified that he wanted them out of the way because for five years he, in his own business, has not made a fair profit. And the utter inconsistency of his testimony is shown by this question and answer: "Q. (By Mr. North.) What do you call a fair manufacturing profit? A. They would be entirely satisfied to do this business at 10 cents a barrel on crude oil that runs through the refinery; I think the Standard Oil Company makes $1.50 to $2 on every barrel that goes through their works."

If it is true that the Standard Oil Company make $1.50 to $2 and they can not make 10 cents, they are not good people to serve the public.

REFINED OIL FROM OHIO CRUDE AS GOOD AS THAT FROM PENNSYLVANIA.

He says that the quality of Standard oil has deteriorated because of using Ohio crude and that the reason is that Lima oil contains arsenic and sulphur. I want to say of the gentlemen connected with the companies represented by Mr. Lee that they have from the very beginning of the great production of oil in Ohio and Indiana, because of their small interest in competition with it in the Pennsylvania region, done their very utmost to depreciate and discredit the standing of the products of Ohio oil in the markets of the world. They came to New York and before the New York Produce Exchange made a very vigorous effort to have the exchange rule that refined oil produced from Ohio crude should not be good delivery in the markets of the world. Their course has been utterly indefensible in respect to the great interest involved in those states, and nothing but the most active effort on our part has saved to those states the markets which are today giving them the profit that is inuring to them in the production of the oil in those states. And I want to say that this is in spite of the fact, which they must have known or could have known, if they had any intelligence on the subject whatever, that after the sulphur element in the Ohio crude was conquered—and it was a very difficult work to conquer it, which we applied ourselves to successfully—the average of the refined oil produced from the Ohio crude has been and is quite equal to that produced from the Pennsylvania crude. That is now admitted by all buyers and in all markets. and is known to consumers where they know anything about it at all. The talk which the agents of the Pure Oil Company and which the Pure Oil Company have made, and continue to make, as to the superiority of their products over even that which we make from the Ohio crude is entire nonsense; it is not true.

I want to call attention to Mr. Lee's testimony, given somewhat in detail, indicating that we obtained higher prices for oil abroad than we do in this country. If that is so—and I do not admit that it is so, but admitting for the sake of argument that it is—it is a pretty good argument that the consumers in the United States are being very well treated by the Standard Oil Company.

FOREIGN GOVERNMENT CONTROL—POPULATION AND OIL CONSUMPTION OF GERMANY AND FRANCE.

He makes a long talk about foreign governmental control, which is about as silly as anybody ever listened to, and I will not take the time to comment on it.

He makes a statement regarding the comparative population and oil consumption of Germany and France, and I refer to this statement only to show how exceedingly careless he is in respect to statements made before this body on matters in which he seeks to influence your minds and that of the public. (Reading.) "Q. Abroad, where the oil of the independent refineries goes, which is not of such a grade as can be consumed in the states

here, does it come into competition with the oil sent there and sold by the Standard? A. Yes; the Standard is doing a very large business in Germany. Germany is the largest oil market in the world; although the population is about the same as France. I think I am not far wrong in that."

The relative population of Germany and France, by the last census of 1891, was: German population, 49,421,803; French, 38,343,192. The consumption of oil in the year 1898, the last year of record, in barrels of 50 gallons, was, in Germany, 3,357,297; and in France, 1,683,146. Mr. Lee said it was 20 times as great in one as in the other and that their population was about the same. I submit this statement to you.

PRICES OF COAL AND MINERS' WAGES.

He makes the statement that the Standard fixes its own price at which it buys coal, and is thus enabled to oppress not only labor in its own line of business, but also the coal. The statement is entirely and absolutely untruthful. The Standard buys its coal on competitive offerings, and if the price is so low as to compel low prices for labor it is the result of competition.

PRICES OF CRUDE OIL.

He goes into an elaborate argument to prove that the prices paid for crude oil have been unremunerative to the producer. This charge, which is more specifically, and I may say hysterically, made by Mr. Lockwood, I will reserve for fuller answer until I reach Mr. Lockwood's testimony.

THE STANDARD'S MANUFACTURE OF CANS AND CASES.

In answer to a query Mr. Lee says that the Standard are largely supplying eastern markets with Russian oil and making their tin cans abroad. I want to submit, gentlemen, a series of statements on this interesting subject. Our business in the canning of oil for the markets where the oil must be put into tin cans and packed in wooden boxes for the market, has been a very important feature from the beginning. It is a business in which we have perhaps expended as much or more industry in keeping and maintaining the markets, as in all the other sections of the world combined, because in those markets we have found our great competitor, Russia, most active. In answer to Mr. Lee's statement that we have practically abandoned this business, and that we are buying Russian oil in bulk and making tin cans abroad in which to put it and send it to the market, I present this statement, being memorandum of our manufacture of tin cans for the five years beginning with the year 1894 and ending with 1898:

Number of five-gallon cans manufactured, five years, 1894 to 1898, inclusive; also cases.

Years	Cases	Cans	Equivalent in boxes of tin plate
United States.			
1894	20,496,942	40,993,884	843,387
1895	18,517,421	37,034,841	761,938
1896	22,998,053	45,996,106	946,298
1897	26,220,579	52,441,158	1,078,895
1898	23,325,335	46,650,671	959,767
Total	111,558,330	223,116,660	4,590,285
Mexico City.			
1894	114,024	228,045	4,693
1895	70,120	140,240	2,885
1896	124,411	248,823	5,119
1897	162,630	325,260	6,692
1898	93,976	187,953	3,866
Total	565,161	1,130,321	23,255
Vera Cruz.			
1894	244,353	488,707	10,055
1895	240,022	480,045	9,876
1896	243,950	487,900	10,037
1897	266,905	533,810	10,981
1898	201,864	403,728	8,306
Total	1,197,095	2,394,190	49,255
Tampico.			
1897	53,044	106,089	2,182
1898	210,252	420,504	8,651
Total	263,296	526,593	10,833
Venice.			
1896	807,775	1,615,550	33,238
1897	704,249	1,408,499	28,977
1898	734,449	1,468,898	30,220
Total	2,246,472	4,492,947	92,435
Savona.			
1896	647,946	1,295,912	26,636
1897	785,995	1,571,990	32,308
1898	763,627	1,527,255	31,379
Total	2,197,578	4,395,157	90,323
Total.			
1894	20,855,318	41,710,636	858,135
1895	18,827,563	37,655,126	774,699
1896	24,822,145	49,644,291	1,021,328
1897	28,193,403	56,386,806	1,160,035
1898	25,379,504	50,659,009	1,042,189
Total	118,027,933	236,055,868	4,856,386

About 2,500 men are steadily employed in this industry in the United States.

In five years we manufactured in the United States 223,116,660 tin cans, which were packed in boxes holding two cans each, the requirement being in boxes made from our native pine. The boxes were made mostly from Canadian pine, but made in this country, lumber being brought here and the labor being employed here. This business involv-

ed the use of 111,558,330 wooden boxes, holding, as I say, two cans each. And we used in this manufacture 4,558,285 boxes of tin plate. The only business that we do outside of the United States in the manufacture of tin cans is where we are compelled to do it by the exigency of freight; in Mexico City a small business, in Vera Cruz a small business, and a small business in Tampico, Mexico, also, the amount of which is entirely inconsiderable. We also do a little canning—a very little—in the exportation of bulk oil and the manufacture of tin cans in Italy, at Venice and Savona, where the traiff and customs make it necessary that we do the canning there. And there are employed in this great industry, at the minimum, in stead, remunerative labor, 2,500 good Americans.

RUSSIAN AND AMERICAN EXPORTS OF OIL IN CASES.

I present here also a statement made up to show the exports of refined oil in cases from Batoum, Russia, from 1894 to 1898, inclusive. I present this statement for the purpose of having you understand something of the menace which attaches to this business at the hands of this great Russian competitor. Our aggregate in all this great business with the east, which we have made such a fight to retain for the American petroleum industry, is now 109,000,000 cases for the five years, as against Russia's 53,000,000; but for the year 1898, perhaps I should read to you, as showing the change in the matter, their shipment was 10,728,603, as against our 22,479,745.

I also present a statement which you, gentlemen, at your leisure, will find great interest in studying, showing the enormous exportation of this particular packing of oil in tins and cases to the markets of the world. It is a business, as I say, which is competed for by these foreign countries most vigorously, on which our hold is uncertain, and which requires the utmost vigilance and encouragement on the part of everything pertaining to the business from America:

Exports of refined oil in cases from Batoum, Russia, during years 1894 to 1898, inclusive.

[Cases.]

To—	1894.	1895.	1896.	1897.	1898.	Total.
Austria	6	.....	.....	.....	.....	6
Bulgaria and Servia	255,800	287,524	305,645	446,383	227,004	1,522,356
Cochin China	.....	.....	.....	95,000	75,840	170,840
China	725,563	1,256,285	1,125,121	1,845,627	907,648	5,860,244
Egypt	803,929	847,298	845,824	1,100,169	1,315,339	4,912,559
England and United Kingdom	.....	.....	500	.....	.....	500
India	2,776,059	4,582,226	3,816,028	3,498,488	3,948,895	18,621,696
Italy	.....	.....	20	.....	.....	20
Japan	311,064	380,000	346,054	614,214	271,880	1,923,212
Java	647,680	1,505,656	974,970	136,225	519,884	3,784,415
Manila	158,482	261,461	152,510	162,600	166,828	901,881
Malta	.....	50,099	16,860	.....	12,150	79,109
Roumania	195,474	82,526	31,107	51,547	42,320	402,974
Portugal	.....	.....	.....	.....	42,610	42,610
Arabia	.....	.....	45,000	.....	.....	45,000
Turkey	2,684,176	1,967,073	2,740,690	3,333,633	2,872,901	13,598,473
Greece	49,481	73,164	23,919	51,117	25,900	223,581
Africa	18,700	79,135	25,025	114,036	121,720	358,616
Suez Canal	2,000	33,209	20,000	.....	.....	55,209
Total exports	8,628,414	11,405,656	10,469,273	11,449,039	10,550,919	52,503,301
Russia	101,594	156,683	94,359	94,499	177,684	624,819
Total shipments	8,730,008	11,562,339	10,563,632	11,543,538	10,728,603	53,128,120

Total petroleum products exported from United States in cases during years 1894 to 1898, inclusive.

[Cases.]

To—	1894.	1895.	1896.	1897.	1898.	Total.
Great Britain:						
Standard Oil Co.	26,500	16,900	17,106	18,520	14,101	93,127
Others	2,500	.....	.....	.....	.....	2,500
Total	29,000	16,900	17,106	18,520	14,101	95,627

Total petroleum products exported from United States in cases during years 1894 to 1898, inclusive.

To—	1894.	1895.	1896.	1897.	1898.	Total.
Holland:						
Standard Oil Co.	100	100	500	.....	.....	700
Others	.....	.....	.....	.....	.....	.....
Total	100	100	500	.....	.....	700
Belgium:						
Standard Oil Co.	280	.....	.....	.....	.....	280
Others	.....	.....	.....	.....	.....	.....
Total	280	.....	.....	.....	.....	280
German North Sea:						
Standard Oil Co.	19,000	20,000	16,300	18,000	21,000	94,300
Others	.....	.....	.....	.....	.....	.....
Total	19,000	20,000	16,300	18,000	21,000	94,300
Sweden and Norway:						
Standard Oil Co.	24,295	2,900	750	400	.....	28,345
Others	.....	.....	.....	.....	.....	.....
Total	24,295	2,900	750	400	.....	28,345
Denmark:						
Standard Oil Co.	.....	.....	.....	.....	1,250	1,250
Others	.....	.....	.....	.....	.....	.....
Total	.....	.....	.....	.....	1,250	1,250
Russian Baltic:						
Standard Oil Co.	1,150	1,500	.....	1,050	.....	3,700
Others	.....	.....	.....	.....	.....	.....
Total	1,150	1,500	.....	1,050	.....	3,700
France:						
Standard Oil Co.	37,400	30	13,500	28,000	18,303	97,233
Others	.....	.....	.....	.....	100	100
Total	37,400	30	13,500	28,000	18,403	97,333
Portugal:						
Standard Oil Co.	123,445	200,832	163,407	249,919	130,891	868,494
Others	13,245	24,912	24,432	30,735	30,010	123,334
Total	136,690	225,744	187,839	280,654	160,901	991,828
Gibraltar:						
Standard Oil Co.	77,060	28,810	65,923	54,259	38,720	264,772
Others	.....	.....	100	.....	.....	100
Total	77,060	28,810	66,023	54,259	38,720	264,872
Italy:						
Standard Oil Co.	1,145,764	715,904	348,000	362,275	312,705	2,884,648
Others	.....	.....	.....	97,002	5,012	102,014
Total	1,145,764	715,904	348,000	459,277	317,717	2,986,662
Malta:						
Standard Oil Co.	.....	.....	.....	27,500	.....	27,500
Others	.....	.....	.....	.....	.....	.....
Total	.....	.....	.....	27,500	.....	27,500
Greece and Greek Archipelago:						
Standard Oil Co.	131,281	193,400	118,700	167,000	152,727	763,108
Others	.....	.....	.....	.....	.....	.....
Total	131,281	193,400	118,700	167,000	152,727	763,108

Total petroleum products exported from United States in cases during years 1894 to 1898, inclusive.

To—	1894.	1895.	1896.	1897.	1898.	Total.
Turkey:						
Standard Oil Co.	88,800	.....	.....	35,900	.....	124,700
Others	.....	.....	.....	.....	.....	.....
Total	88,800	.....	.....	35,900	.....	124,700
Egypt:						
Standard Oil Co.	230,095	32,850	161,432	236,058	.....	660,435
Others	.....	.....	.....	.....	.....	.....
Total	230,095	32,850	161,432	236,058	.....	660,435
North Coast of Africa:						
Standard Oil Co.	175,821	167,544	74,200	80,526	83,004	581,095
Others	.....	.....	5,000	5,426	.....	10,426
Total	175,821	167,544	79,200	85,952	83,004	591,521
Indian Archipelago and Islands of China Sea:						
Standard Oil Co.	298,081	173,634	373,627	215,639	82,271	1,143,252
Others	47,300	13,230	.....	.....	.....	60,530
Total	345,381	186,864	373,627	215,639	82,271	1,203,782
West Coast of Africa:						
Standard Oil Co.	85,641	122,693	154,966	190,089	79,657	633,046
Others	26,132	6,327	23,129	12,193	7,093	74,874
Total	111,773	129,020	178,095	202,282	86,750	707,920
East India:						
Standard Oil Co.	3,071,929	3,054,529	2,818,933	3,561,390	2,631,349	15,138,130
Others	253,800	6,000	12,000	6,000	.....	277,800
Total	3,325,729	3,060,529	2,830,933	3,567,390	2,631,349	15,415,930
Java:						
Standard Oil Co.	1,511,236	1,603,130	1,772,670	1,434,081	1,321,833	7,642,950
Others	.....	.....	.....	.....	.....	.....
Total	1,511,236	1,603,130	1,772,670	1,434,081	1,321,833	7,642,950
China:						
Standard Oil Co.	3,951,031	2,293,248	4,791,618	6,352,811	4,945,962	22,334,670
Others	289,525	.....	.....	.....	.....	289,525
Total	4,240,556	2,293,248	4,791,618	6,352,811	4,945,962	22,624,195
Japan:						
Standard Oil Co.	3,619,576	2,607,214	4,095,758	4,373,299	5,467,215	20,163,062
Others	282,037	.....	.....	.....	.....	282,037
Total	3,901,613	2,607,214	4,095,758	4,373,299	5,467,215	20,445,099
South Coast of Africa:						
Standard Oil Co.	345,471	431,039	398,974	599,051	470,102	2,244,637
Others	24,190	13,000	11,242	15,445	14,500	78,377
Total	369,661	444,039	410,216	614,496	484,602	2,323,014
East Coast of Africa:						
Standard Oil Co.	.....	.....	.....	.....	.....	.....
Others	124,151	50,000	148,813	163,625	93,000	579,589
Total	124,151	50,000	148,813	163,625	93,000	579,589
Islands in the Indian Ocean:						
Standard Oil Co.	37,000	38,500	54,950	51,800	33,000	215,250
Others	.....	2,892	5,000	500	500	8,892
Total	37,000	41,392	59,950	52,300	33,500	224,142

Total petroleum products exported from United States in cases during years 1894 to 1898, inclusive.

To—	1894.	1895.	1896.	1897.	1898.	Total.
Arabia:						
Standard Oil Co.	261,845	119,200	276,878	175,720	66,100	899,743
Others	1,500	58,000	.....	.....	.....	59,500
Total	263,345	177,200	276,878	175,720	66,100	959,243
Sandwich Islands and Islands in the Pacific:						
Standard Oil Co.	36,431	78,713	44,472	78,488	69,944	308,048
Others	15,343	4,786	1,526	100	1,000	22,755
Total	51,774	83,499	45,998	78,588	70,944	330,803
Australia:						
Standard Oil Co.	1,119,288	1,002,069	1,179,713	1,268,563	1,219,421	5,789,054
Others	92,586	133,035	113,000	169,100	186,750	694,471
Total	1,211,874	1,135,104	1,292,713	1,437,663	1,406,171	6,483,525
New Zealand:						
Standard Oil Co.	192,975	208,528	279,333	276,010	233,522	1,190,368
Others	17,515	10,180	.....	.....	.....	27,695
Total	210,490	218,708	279,333	276,010	233,522	1,218,063
British North America:						
Standard Oil Co.	16,260	17,433	15,076	5,301	6,425	60,495
Others	1,891	1,743	1,215	1,828	2,400	9,077
Total	18,151	19,176	16,291	7,129	8,825	69,572
Mexico:						
Standard Oil Co.	8,563	8,658	8,999	2,617	3,397	32,234
Others	12,095	7,423	3,930	41,622	26,041	91,111
Total	20,658	16,081	12,929	44,239	29,438	123,345
Central America:						
Standard Oil Co.	106,019	105,837	136,181	120,386	140,001	608,424
Others	34,429	29,391	21,313	18,710	13,657	117,500
Total	140,448	135,228	157,494	139,096	153,658	725,924
Cuba:						
Standard Oil Co.	500,004	393,255	255,334	267,032	194,150	1,609,775
Others	8,939	1,954	2,109	3,095	17,382	33,479
Total	508,943	395,209	257,443	270,127	211,532	1,643,254
West Indies:						
Standard Oil Co.	425,537	458,483	493,290	441,599	421,550	2,240,459
Others	65,379	66,785	65,145	61,453	65,489	324,251
Total	490,916	525,268	558,435	503,052	487,039	2,564,710
Northeast Coast of South America:						
Standard Oil Co.	249,833	223,400	247,525	228,019	284,584	1,233,361
Others	55,618	51,968	57,237	63,172	54,751	282,746
Total	305,451	275,368	304,762	291,191	339,335	1,516,107
Brazil:						
Standard Oil Co.	1,539,303	1,496,370	1,596,327	2,111,730	1,988,763	8,732,493
Others	9,779	7,744	9,445	6,557	8,919	42,444
Total	1,549,082	1,504,114	1,605,772	2,118,287	1,997,682	8,774,937
Southeast Coast of South America:						
Standard Oil Co.	567,506	539,344	518,283	360,199	280,892	2,266,224
Others	301,576	502,821	759,360	873,197	789,738	3,226,692
Total	869,082	1,042,165	1,277,643	1,233,396	1,070,630	5,492,916

Total petroleum products exported from United States in cases during years 1894 to 1898, inclusive.

To—	1894.	1895.	1896.	1897.	1898.	Total.
West Coast of South America:						
Standard Oil Co.	185,308	316,433	274,755	289,283	353,539	1,419,318
Others	108,022	173,340	155,385	107,450	97,025	641,222
Total	293,330	489,773	430,140	396,733	450,564	2,060,540
Grand total:						
Standard Oil Co.	20,209,828	16,672,480	20,767,480	23,682,514	21,066,378	102,398,680
Others	1,787,552	1,165,531	1,419,381	1,677,210	1,413,667	7,463,041
Total	21,997,380	17,838,011	22,186,861	25,359,724	22,479,745	109,861,721

Q. (By Mr. Smyth.) Is there any competition from America? A. There is practically no competition from America. I do not know but these gentlemen do some small amount of business. It is almost inconsiderable from the fact that we do not even known that they are doing it.

Q. The principal competition comes from Russia? A. The principal competition comes from Russia, and now from the far east, as I will explain a little further along. There is getting to be a large production of oil, especially in the Dutch East Indies, but I will go into that in another place.

I may add, gentlemen, just by way of a word of explanation, that I think in all those countries to which we send oil we have our own active American agents on the alert for the American industry; and this gentleman comes here and states that we are not doing this business.

CONDITION OF THE OIL REGION.

In answer to the query, or in pursuing the argument, rather, that the Standard had so governed prices for oil as to have made it an unremunerative business in the oil country, Mr. Lee made a most astonishing statement, that the countries producing oil are not as well off as though they had never produced a barrel of oil. That section prior to the opening of the oil industry was a comparative wilderness, noted, if it was noted at all, principally for its hemlock and buckwheat. The oil production has made it a world renowned center of marvelous activity. It has taken there a population of tens of thousands, I may say hundreds of thousands, of prosperous, happy, contented people, the like of which probably does not exist in the same territory in any place on God's footstool. The oil production has built towns and cities and railroads. It has given employment—steady, remunerative employment—to thousands of American workingmen through all this period; and for a man to stand up, who comes from that section, with a knowledge of conditions as they exist there, and make such a statement, is, as I say, utterly incredible.

CAPITAL, PROFIT, STOCKHOLDERS, OF THE STANDARD.

Q. (By Representative Livingston.) In connection with this statement you have just made, will you give us the amount of capital invested in the Standard Oil Company, and a list of all the stockholders, and the profits on that investment? A. The figures with reference to all the questions are being made up, as Mr. Jenks knows.

Q. A list of the stockholders?

(By Mr. Jenks.) A list of stockholders, I may say, was not asked for in the general schedule.

Q. (By Representative Livingston.) Well, I am asking for it now? A. I can not answer as to that.

Q. (By Mr. Phillips.) Would you be willing to meet the commissioner's request and furnish a list of the Standard's stockholders in the trust as it formerly existed, and the combination as it now exists? A. I could not answer now without further conferring in reference to that statement.

Q. (By Representative Livingston.) Will you promise the commission that you will confer with the authorities, and if these things are not inconsistent and impracticable, you will furnish them? A. If they are not inconsistent and impracticable I should be glad, of course, to give any statement that might be asked.

Q. (By Mr. A. L. Harris.) Would not this be the best testimony in refuting the statements made by Senator Lee, to give the taxable property of those counties previous to the discovery of oil and at the present time? A. I think it would be very interesting.

Simply as an illustration of the point I make of the absurdity of Mr. Lee's statement, I present for your information a statement of the value of Pennsylvania crude oil as compared with that of other states, the total production from the beginning of the industry to the year 1898, inclusive, and figured on a very conservative basis.

Total production and value of Pennsylvania crude oil, 1859 to 1898, inclusive.

[Barrels of 42 gallons.]

Year	Production	Average price per barrel at wells	Total value	Land Interest	Working interest value
	Barrels.				
1859	8,500	$20.00	$ 170,000.00	$ 21,250.00	$ 148,750.00
1860	650,000	9.60	6,240,000.00	780,000.00	5,460,000.00
1861	2,118,000	.52	110,136.00	13,767.00	96,369.00
1862	3,056,000	1.05	3,208,800.00	401,100.00	2,807,700.00
1863	2,631,000	3.15	8,287,650.00	1,035,956.25	7,251,693.75
1864	2,116,200	8.15	17,247,030.00	2,155,878.75	15,091,151.25
1865	2,497,700	6.59	16,459,843.00	2,057,480.37	14,402,362.63
1866	3,597,500	3.75	13,490,625.00	1,686,328.13	11,804,296.87
1867	3,347,300	2.40	8,033,520.00	1,004,190.00	7,029,330.00
1868	3,715,800	3.63	13,488,354.00	1,686,044.25	11,802,309.75
1869	4,215,000	5.60	23,604,000.00	2,950,500.00	20,653,500.00
1870	5,659,000	3.90	22,070,100.00	2,758,762.50	19,311,337.50
1871	5,795,000	4.40	25,498,000.00	3,187,250.00	22,310,750.00
1872	6,539,100	3.75	24,521,625.00	3,065,203.13	21,456,421.87
1873	9,893,786	1.80	17,808,814.80	2,226,101.85	15,582,712.95
1874	10,926,945	1.15	12,565,986.75	1,570,748.34	10,995,238.41
1875	11,987,514	1.25	14,984,392.50	1,873,049.06	13,111,343.44
1876	9,120,669	2.58	23,531,326.02	2,941,415.75	20,589,910.27
1877	13,337,363	2.39	31,876,297.57	3,984,537.20	27,891,760.37
1878	15,381,641	1.17	17,996,519.97	2,249,565.00	15,746,954.97
1879	19,894,288	.86	17,109,087.68	2,138,635.96	14,970,451.72
1880	26,245,571	.94	24,670,836.74	3,083,854.59	21,586,982.15
1881	27,561,376	.85	23,427,169.60	2,928,396.20	20,498,773.40
1882	21,528,621	.79	17,007,610.59	2,125,951.32	14,881,659.27
1883	23,302,021	1.06	24,700,142.26	3,087,517.78	21,612,624.48
1884	23,952,290	.84	20,119,923.60	2,514,990.45	17,604,933.15
1885	21,528,621	.88	18,945,186.48	2,368,148.31	16,577,038.17
1886	26,603,945	.71	18,888,800.95	2,361,100.13	16,527,700.82
1887	22,873,450	.67	15,325,211.50	1,910,651.44	13,409,560.06
1888	16,905,890	.87	14,708,124.30	1,838,515.54	12,869,608.76
1889	22,349,825	.94	21,008,835.50	2,626,104.44	18,382,731.06
1890	30,065,867	.87	26,157,304.29	3,269,663.04	22,887,641.25
1891	35,742,127	.67	23,947,225.09	2,993,403.13	20,953,821.96
1892	33,332,306	.56	18,666,091.36	2,333,261.42	16,332,829.94
1893	31,256,283	.64	20,004,021.12	2,500,502.64	17,503,518.48
1894	30,696,716	.84	25,785,241.44	3,223,155.18	22,562,086.26
1895	30,891,868	1.35	41,704,021.80	5,213,002.72	36,491,019.08
1896	33,908,041	1.19	40,350,568.79	5,043,821.10	35,306,747.69
1897	35,170,367	.78	27,432,886.26	3,429,110.78	24,003,775.48
1898	31,645,151	.91	28,797,087.41	3,599,635.92	25,197,451.49
Total	662,048,642	1.163	769,948,397.37	96,243,549.67	673,704,847.70

This table shows that during this period, and this is an interesting statement, I am sure, that there has been taken from the oil fields of Pennsylvania 662,048,642 barrels; and that the average for all that period of the prices paid at the wells for the oil is $1.163, or a total value of $769,948,397.37.

ROYALTIES TO LANDOWNERS.

Q. (By Mr. Smyth.) That amount has been paid to the producers for crude oil? A. This amount has been paid to the producers for crude oil. Now, as has probably been brought out to you in the course of this testimony, the oil producing business is done largely on a basis of what is called royalty. That is, the operator takes a lease of the land and pays to the land owner, who is usually a farmer in that section, a certain free royalty interest for the right to occupy and drill the land.

Q. (By Mr. Smyth.) That right to occupy does not interfere with the agricultural pursuit of the farmer? A. No; it is held as free as possible from that interference. That royalty right of payment has varied during the history of the business from one-half of the oil found to the present ruling basis of one-eighth, which basis prevails perhaps today through the larger part of the oil producing country. Of the crude produced one-eighth goes over to the land owner; and for that he does nothing, as I say, but furnish the surface on which to drill.

Q. (By Representative Livingston.) Now, will you go further and give us the average profits you have made on all those wells? A. Now, what I want to say is, that figuring for the whole period that the payment was one-eighth and not the high amount that has prevailed through most of the period, the payment in royalties alone to the people of that section on the oil produced would amount during that period to the sum of $96,243,549.67.

Q. (By Mr. Smyth.) You think these counties are worse off than before the oil wells were drilled? A. If you have traveled through them you will not think so.

Q. (By Mr. Clarke.) What is the population of that region? A. It would be a mere guess on my part. Mr. Boyle or Mr. Lee could answer more intelligently than I. I have not lived there for some years; I would say about 350,000.

SOUTH IMPROVEMENT COMPANY.

Again Mr. Lee refers in answer to a question by Mr. Jenks, to the South Improvement Company, as though it was actually doing business, which was not true.

Q. (By Mr. Clarke.) The South Improvement Company did fix rates, did they not? A. Never to do business.

Q. But they had rates fixed? A. There was a contract entered into, but abolished before it became operative.

Q. But there was another contract, and is it not in sworn testimony that that contract was in existence only two weeks afterwards, and did or did not the rates fixed by the South Improvement Company prevail after the Standard Oil Company came into existence? A. I have no knowledge of any relations on the part of the Standard Oil Company succeeding to the South Improvement Company whatever. I have been an opponent of the South Improvement Company, as you well know. I have disapproved of it in theory, and practically disapprove of it today. I want to say that the statements that that which was the South Improvement Company is continued in the Standard are not true; if they had been true, I would not have been in it.

THE SHUT-DOWN MOVEMENT.

Mr. Lee refers to the shut-down movement, so-called. It was entered into at the request of the producers, who alleged they were suffering from low prices incident to a large accumulation of stock. Our relation to it was entirely the result of the urgency of the producers, who were represented by a committee; they expressed the greatest satisfaction with our course. I want to present for your knowledge, in support of my statement in this respect, the testimony of Mr. Thomas W. Phillips, given before the Congressional committee inquiring on this subject in 1888, page 112. I will read the concluding part:

"We are certain that there would have been much bankruptcy in that region had this movement not been made. I will state further, in justice to them, that this was not a movement on the part of the Standard Oil people. It was a movement conceived by the producers themselves. They approached the Standard people in regard to this matter, and after long negotiation, which you have here in testimony, the contract, which you also have, was formulated and signed."

Q. (By Mr. Phillips.) I assert the same thing today. A. That answers Mr. Lee's statement.

Mr. Lee says: "I believe if there had been 50 concerns engaged in the manufacture of petroleum, that just as wide markets would have been obtained for the article, and that while the consumer would not have paid any more for his oil, the producers would have realized better prices and have had a handsome profit, whereas I think they have not made any profit."

I present here a statement showing in detail the list of oil refineries in the United States, with their capacity, averaging a life to this time, the first of this year, the end of December, 1898, of 14 years, and numbering 66 in all.

Capacities of outside refineries.

Year built	Name and place of refinery	Number and capacity of stills	Total still capacity	Remarks
	Oil City, Pa.:			
1882.....	Independent Refining Co., Limited.	2, 250; 1, 500 1, 600; 2, 700	3,000	Naphtha plant.
1885.....	Continental Refining Company, Limited.	3, 580; 1, 600 2, 250; 1, 500	2,340	
1887.....	Penn Refining Co., Limited...	3, 500	1,500	Do.
	Rouseville:			
1888.....	Germania Refining Company.	1, 800; 2, 250	1,300	Pressing plant.
	McClintockville:			
1888.....	Crystal Oil Refining Company.	1, 250; 5, 100	750	
1883; burned rebuilt 1890.	Reno:			
	Empire Oil Works.....	2, 500; 2, 250	1,500	Naphtha plant; pressing plant.
	Franklin, Pa.:			
1882.....	Relief Oil Works.....	2, 250; 1, 600	1,100	
1880.....	Petrolia: I. Dougherty.....	1, 16	16	
1880.....	Karns City: Bech Bros.....	1, 100	100	
	Norristown:			
	Montgomery Oil Works.....	2, 100	200	
1887.....	Beaver: Beaver Oil Works.....	2, 60	120	
1887.....	Industry: Scott Oil Co.....	2, 25	50	
	Kendall, Pa.:			

Capacities of outside refineries.

Year built	Name and place of refinery	Number and capacity of stills	Total still capacity	Remarks
1882.....	Emery Manufacturing Co.....	8, 600; 3, 125	5,175	Naphtha works, paraffin and tar stills.
1883.....	Kendall Refining Co.....	1, 150; 2, 100		Make lubricating oils.
1892.....	Eldred, Pa.: United Oil Co.....	1, 80	350	Lubricating and refined.
	Titusville, Pa.:		80	
1881.....	Robert Foggan	1, 250; 1, 350 1, 600; 1, 815	2,015	Naphtha works.
1885.....	American Oil Works.....	1, 750; 1, 500	1,250	
1888.....	Titusville Oil Works.....	1, 500; 1, 280 1, 140	920	Do.
1887.....	Oil Creek Oil Co.....	2, 350; 2, 125	950	Paraffin plant.
1896.....	Climax Gasoline Co.....	1, 250; 1, 350 1, 350	950	Naphtha works.
1893.....	Pennsylvania Paraffin Works....	4, 350; 1, 250	1,650	
	East Warren:			
1888.....	Cornplanter Refining Co.....	2, 150; 2, 100 1, 125; 1, 100 1, 250	975	Filtering works.
1885 and 1889	Crew-Levick Co.	3, 125; 3, 150	825	Do.
1892.....	Seneca Oil Co.....	4, 150	600	Do.
1897.....	Wilburine Oil Works.....	1, 500; 2, 300	1,100	Lubricating works.
1886.....	North Warren: Warren Refining Company.	2, 225; 1, 225 1, 200	875	Filtering works.
	Clarendon:			
1885.....	Tiona Refining Company.....	3, 100; 1, 50	350	Do.
	Fidelity Oil Works.....	3, 100	300	Wax plant.
1894.....	Bolivar: Bolivar Refinery.....	1, 50	50	
	Pittsburg, Pa.:			
	Miller Oil Works.....	1, 1,400 2, 250; 1, 275	2,175	Barrel factory, Naphtha works, tar stills.
1880.....	Waverly Oil Works.....	2, 500 2, 300; 2, 35	1,670	Do.
	Union Oil Works.....	2, 40	80	
	Freedom, Pa.:			
	St. Clair Oil Company.....	2, 40	80	
1879.....	Freedom Oil Works.....	1, 250; 1, 300 2, 50	650	Tar still, naphtha and paraffin works.
	Washington, Pa.:			
1890.....	Beaver Refining Co.....	1, 150; 1, 100	250	
1887.....	Leader Refining Co.....	4, 200	800	
	Coraopolis, Pa.:			
1892.....	Pittsburg Refining Co.....	1, 250; 2, 200 1, 375	1,025	
1899.....	Penn Petroleum Works.....	1, 150; 1, 250	400	
	Murraysville, Pa.:			
1884.....	Philadelphia Co.	1, 50	50	
	Philadelphia, Pa.:			
1881.....	Crew, Levick & Co.....	2, 80; 1, 500 1, 125	785	
1881.....	Delaware Oil Co.....	1, 300; 3, 100 3, 200; 1, 250	1,450	
1877.....	Bossardt & Wilson.....	1, 220; 2, 125	470	
1874.....	Philadelphia Lubricating Co....	1, 250; 1, 100	350	
	Marietta, O.:			
1875.....	Ohio Oil Works.....	1, 150; 1, 100 1, 600; 1, 300	1,150	
1862.....	Marietta Oil Works.....	1, 225	225	
1864.....	Producers' Refining Co.....	1, 250	250	
1893.....	Buffalo, N. Y.: Crystal Oil Works.	1, 150	150	
	Cleveland, O.:			
1883.....	National Refining Co.....	1, 300; 2, 85	470	Naphtha works.
1883.....	Cleveland Refining Co.....	3, 75; 1, 110 2, 100; 1, 85 1, 65	885	
1873.....	Great Western Refinery.....	2, 300; 8, 80	1,240	
1864.....	Merriam & Morgan.....		.....	No crude stills; tar and pitch.
	Toledo, O.:			
1889.....	Paragon Refining Co.....	4, 400; 8, 500 3, 800	8,000	
1895.....	Craig Oil Co.....	4, 550; 1, 600	2,800	Tar stills, wax works.
1895.....	Diamond Oil Co.....	3, 400; 2, 400	2,000	

Capacities of outside refineries.

Year built	Name and place of refinery	Number and capacity of stills	Total still capacity	Remarks
1890.....	Welker, O.: Manhattan Oil Co...	12, 600	7,200	Do.
	Florence, Colo.:			
1887.....	Florence Oil Co.....	2, 600; 5, 100	1,700	
1887.....	Western Oil Co.....	2, 76; 2, 65 1, 75; 2, 78 2, 500; 4, 250 2, 570	3,653	
1879.....	San Francisco: Alameda Refinery	1, 1000; 1, 200 1, 400; 1, 80 8, 35	1,960	
1898.....	Los Angeles: Franklin Oil Co...	2, 50; 1, 100	200	
1896.....	Oleum, Cal.: Union Oil Co.....	1, 150; 3, 150	600	
1896.....	Puente, Cal.: Puente Oil Co.....	2, 250	500	
1897.....	Ventura, Cal.: Ventura Oil Co...	2, 60	120	
	New York:			
1879.....	Tide Water Oil Co.....	18, 800; 16, 600 12, 650; 17, 600 2, 450; 1, 250	43,150	Have tar and reducing stills.
1889.....	Columbia Oil Works.....	4, 650; 4, 700	5,400	
	Edgewater Oil Co.....	7, 400	2,800	
	Total (66 in all).....	.....	125,079	
	Total capacity of outside steam stills	.....	19,825	
	Total capacity of outside tar stills	.....	1,355	
	Grand total outside capacity.	.....	146,259	

The average time since the above refineries commenced operations is now 14 years.

COMBINATIONS AND LABOR.

Mr. Lee makes a very labored effort to show that trusts and combinations affect labor injuriously. The best refutation possible of this statement is the record of our own experience. The fact being that for all of the years we have been engaged in business we have had scarcely any serious difficulty with the vast body of men employed. On the other hand, we assert most positively that, as a whole, there never was a more zealous body of employes than have been connected with our interests. We have been practically without strikes; our labor is well paid and contented in every department, and I submit that our experience in this regard is the best possible proof of the advantages of labor and capital working together on intelligent lines, where the rights of each are fairly considered. I am a firm believer in the right, and, indeed, the duty, of labor to organize, as I am in favor of the combination and organization of capital. Of course it is true that the labor organizations often do very unwise and arbitrary things. They fall frequently into the hands of leaders who are demagogic and lack the qualities of intelligent leadership, and they are badly influenced also by political demagogues, whose sole stock in trade is often their ability to talk loudly against capital and the employing class; and above all, they are too much influenced by the bad advice of an element in the public press that is utterly depraved and demagogic and which teaches them altogether false ideas as to their duties. They will, however, learn better as time goes on. Capital, on its side, has made and is making grievous mistakes in the treatment of labor; but the two are moving together on irresistible lines toward organization and a better mutual understanding, and one of these days labor will realize, as the employing class already knows, that the howling of a demagogue is hurtful to all concerned, and a better era of understanding between the employer and the employ will be brought about.

MR. LEE'S REMEDIES.

At the end of his testimony Mr. Lee suggests remedies. They seem almost too frivolous to demand attention. His views on destructive competition, the limitation of capital, etc., seem altogether too absurd to call for special attention. I may say in conclusion, that he has taken good care to organize his own company or embryonic trust in the very state (New Jersey) which he criticises so severely, with a view, undoubtedly, to make his capital quite unlimited if he finds it will float.

OPERATIONS OF THE STANDARD IN OHIO.

I turn next to the testimony of Mr. Monnett, the attorney general for the state of Ohio. I want to say, by way of preface, before answering directly the points presented by Mr. Monnett that we are interested in Ohio, in whole or in part, in a num-

ber of corporations, duly chartered by the state, and all carefully observing the obligations imposed on them by their charters. The actual amount paid in taxes is in the neighborhood of $250,000. The aggregate amount paid in wages to about 4,700 employes in the state by this organization is over $3,250,000 per annum. The further distribution of money in the state for fuel and supplies of all kinds would amount to a vast sum. I submit for your consideration whether we are not a valuable client of the state and entitled to protection rather than persecution. That Mr. Monnett's course has been an effort at the most malignant possible persecution and probably worse, I will endeavor to show in taking up his testimony.

Mr. Monett makes a statement that there has been great discrimination in favor of the Union Tank Line or Standard Oil Company. The rates fixed by the railroads in connection with tank car lots and single barrel or part car lots have been the same to all, and carried with them no discrimination whatever in favor of the Standard Oil Company. In other words, I deny the allegation particularly.

ALLEGED BURNING OF BOOKS.

Regarding the alleged burning of books at Cleveland, Ohio, I want to deny the fact of any such burning absolutely. At the time of the original inquiry on the subject we offered to produce every employe who could have any knowledge on the subject, who would each have denied the statement as to the burning of the books. The attorney general refused to have them sworn at the time, and at the time Mr. Monnett gave this testimony he knew that Mr. Squires, the then secretary of the Standard Oil Company of Ohio, had made an affidavit in the litigation pending in Ohio that the books were in his possession. Any denial that I have made regarding the matter, or any statement that I have made in reference to the testimony in connection with it, is true, and it is not true that I have made any retraction, as Mr. Monnett states, with reference to any statement that I have made. Mr. Monnett's reiteration of this matter, after all that has been shown regarding it is most reprehensible. I would like to characterize this in stronger terms, but I bow to the wish of the commission.

AMOUNT OF TRUST CERTIFICATES ISSUED.

Mr. Monnett endeavors to carry the impression that more Standard Oil Trust certificates were issued than our statements have shown. The allegation is made without a scintilla of truth to sustain it. It is contrary to all the evidence that was offered in the case, and it is utterly destitute of the truth. The stock and transfer books of the trust were placed in the hands of Mr. Monnett's associate, Mr. Kincaid, during the Ohio investigation, who examined them thoroughly and expressed himself as thoroughly satisfied.

DISMANTLING OF WORKS.

He speaks with feeling with reference to our having dismantled some works at Marietta. I want to call attention to two at Marietta, Mr. Rice's and Mr. Davis's, and I do not recall that we have dismantled any there. I do not know of any works there that we have dismantled.

Q. (By Mr. Farquhar.) This commission, in some of its testimony, has had considerable stress laid on the dismantling of the works by your company, and the delocalizing, transferring of business from towns and other places and the concentration into larger plants. Would you give the business reasons of the Standard with respect to any of these changes? A. I shall be glad to, and I have it in another place. I think you will find it amply treated.

THE STANDARD'S OIL BUSINESS.

Mr. Monnett makes a statement which, even to a person unfamiliar with the oil business is quite unintelligible, to the effect that somehow from the business of Ohio oil we make $120,000,000 a year. It is entirely ridiculous. As I say, it is exceedingly difficult to know what he has in his mind. It certainly had no relation to the facts. I have had prepared a statement which shows the total sales in the State of Ohio of refined oil products for 1898 to be $979,798.56.

Q. (By Mr. Jenks.) That includes all by-products? A. Yes; I will ask you to discount his statement at least $119,000,000.

Q. (By Mr. Clarke.) That is the sales by your company? A. These were the total sales.

BRIBERY CASE IN OHIO.

I must speak somewhat guardedly, in the nature of things, about what Mr. Monnett saw fit to say about the conduct of bribery cases in Ohio. With reference to the so-called "bribery" cases in Ohio, I desire to say that affidavits have been filed with the supreme court of the State of Ohio denying specifically all of Mr. Monnett's charges of attempted bribery and all of his allegations in relation thereto, and asking the court to appoint a commission to investigate the charges. The court has not yet acted upon the subject. If they do not, we will then see whether there is not some other method by which Mr. Monnett can be compelled to answer on this matter.

Q. (By Mr. Farquhar.) What is the supposed amount of bribery? A. The newspapers have it about $400,000.

Q. (By Mr. Smyth.) Paid to whom—to Monnett? A. To Mr. Monnett; yes. I say we have answered the matter and our answer is before the supreme court. With reference to what our final attitude will be it would be unwise for me to state now. We court an investigation.

Q. (By Mr. Ratchford.) Are you prepared to say that such a proposition might not have been made

without your knowledge, or do you deny—— A. We have denied it to the very utermost. Our answer is now in court.

Q. The answer of your company? A. The answer of our company.

I want to speak a word regarding the recommendation by Mr. Monnett of Mr. W. H. Clark, of Newark, Ohio, as a competent witness. In recommending this witness to you Mr. Monnett must have known that he was an untruthful, dishonest, discharged employe, and his imposing him upon you as a witness was an insult alike to you, to our interest, and to the country at large.

COMPETITION IN OHIO.

Mr. Monnett testifies, in answer to a question by Mr. Harris, as follows: "Q. What companies are competing with the Standard Oil Company in Ohio now? A. There is only a limited competition—I think the Scofield, Shurmer & Teagle people; and a man by the name of Shull, at Mansfield, has an independent agency and only a limited product. The Shurmer & Teagle people originally had a contract whereby they were allowed to live—to sell and live."

Mr. Monnett again refers to the absence of competition in Ohio and repeats that he does not know of a single independent chartered corporation left in the State of Ohio. However, he attempts to carry the impression that we are attempting to deceive the public by operating through different names in the State. He quotes the Penn Oil Company. I do not know what he means by this, as we have no such company operating in the State.

I now submit statements showing a partial list of our competitors in Ohio, composed of pipe lines, refiners, and producers, covering corporations, partnerships, firms, and individuals. The list is only partial, but it gives some indication of the utter lack of knowledge, or worse, that actuated Mr. Monnett in his statement. I will give you a summary of the incorporated companies engaged in the State of Ohio; not in the southern part, but in the Lima district. There are 159 corporations.

Q. (By Mr. Smyth.) Not controlled by the Standard Oil Company? A. Not to the interest of a dollar. They are, of course, all creatures of the State of Ohio, and if not chartered under the State they are all registered under the laws of Ohio and paying taxes in that State. There are 258 partnerships.

Q. Not owned or controlled by the Standard Oil Company? A. Not to the extent of a dollar.

Q. Not agents? A. Not agents of the Standard Oil Company in any way or sense.

Q. (By Mr. Phillips.) Have you any interest in these companies, in producing them? A. None that I know of.

Q. You have alliances with producers in the Pennsylvania field? A. Our business in Ohio is done in the name of the Ohio Oil Company.

Q. The point I wish to make is this. Have you not an eighth, a quarter, or a third in the leases in Ohio, as you have in Pennsylvania? A. Not in these I am presenting.

Q. In Pennsylvania and West Virginia you have? A. Not that I know of.

Q. Are you not interested a quarter or an eighth? A. We may be to a small extent.

Q. (By Mr. Jenks.) But not at all in any of these? A. It is such a trifling exception as not to be an exception, if at all. Of individuals there are 1,240, 159 corporations, 258 partnerships; and there are of refining concerns not in the remotest degree related to the Standard Oil Company eight active large concerns chartered by and doing business in the State of Ohio, which makes a grand total of concerns doing business in competition with us of 1,665 in the Lima district against Mr. Monnett's one concern that he could name and one business man that had a station at Mansfield.

Q. (By Mr. Phillips.) What per cent of the Lima field do you control in production? A. I have that here.

Q. (By Mr. A. L. Harris.) I had in my mind, when I asked Mr. Monnett the question, the refining companies; not the producing companies. A. He answered also regarding the producing companies—regarding them all.

Q. I asked the question with reference to the refining companies, and I think that he intended to make the answer to my question. A. His answer mentioned producing companies, and he spoke about the Penn Company being a producing company, but claimed that was ours.

Q. Is that a refining company? A. It is a producing company.

Q. (By Mr. Ratchford.) The witness has stated that the Standard Oil Company has virtually no interest in a number of producing companies he has mentioned. Have they no interest in the refining companies? A. None whatever, I believe.

Q. No relation with refining companies? A. None whatever.

Q. (By Mr. A. L. Harris.) How many refineries outside of the Standard are in operation in Ohio now? A. I have just given them. I do not think this covers them all, but the larger ones. This was made the first of the year. They are: Craig Oil Company, Cleveland Refining Company, Diamond Oil Company, Manhattan Oil Company, National Refining Company, Producers Refining Company, Paragon Refining Company, and the Sun Oil Company. This is made up with reference to the Ohio field. I might say also that the business done by these companies, and in which we had not one dollar of interest, direct or indirect, or one iota of control in any way, aggregated for the five years from 1894 to 1898, inclusive, 14,647,949 barrels. I am reminded there are some Cleveland refineries in competition with ours, not included in this list. By the way, these Cleveland refineries are included in the general list of refineries which I gave in answer to Mr. Lee's testimony. I have further a supplementary list of competitive producing companies, made up of organizations, corporations, partnerships, and indivduals operating in southern Ohio, apart from the Lima field, aggregating 16 corpora-

tions, 8 partnerships, 69 individuals, or a total of 93 in that section, which should be added.

AGITATION OF THE OIL TRUST IN ENGLAND.

Mr. Monnett shows his vindictiveness as against the American oil industry by applauding a scurrilous pamphlet put out by one of the yellow journals of London at the instance of the Russian oil dealers as against American oil. There was not a word of justification for the statements made, and a committee of parliament, who have gone into the subject most thoroughly with reference to possible legislation on the oil test question in England, have upheld American oil as against all the outrageous charges made by the Russian industry and given publicity through this scurrilous pamphlet. I wish to say one word on the magnitude of the Russian oil industry and its menace to our American industry. Nowhere during the past year have they made so determined an effort against American oil as they have in England, and they have retained a journal of the lowest order to make these scurrilous attacks. The name of the journal is the Star, and this pamphlet is published undoubtedly at their instance, although it is anonymous in its character. Even the Russian people who put it out would not put their names to it. I have here a further statement of the Russian oil industry, giving statistics in detail, which I am sure you will find of great interest.

Q. (By Mr. Jenks.) Can you give us a reference to the official statements of the committee of parliament to which you refer? A. I will get that for you.

Q. (By Mr. Farquhar.) You state the Star article is on the side of the Russian industry? A. They applaud the Russian oil and decry American oil; that is the purpose of the publication. The thing is to cry down the American oil.

Q. And you claim they injure the Standard? A. That is where they—yes; we are the large distributors.

Q. What is the test? A. 73 Abel.

Q. What is the equivalent of the test? A. About 120. I might add a further list of the Ohio companies organized since November, 1898, and not yet published. I will put them in.

PRICES OF CRUDE AND REFINED OIL, 1870 TO 1898.

Mr. Monnett endeavors to make a statement that the dismantling of the Standard Oil Company would reduce prices to consumers. I wish to answer this by giving statistics showing the record of cost and prices for a period.

The world-wide facilities employed by the Standard Oil Company and its affiliated interests for the distribution of refined oil would involve years of effort, and a similar amount of capital to replace, and would immeasurably increase the cost of oil to the consumer.

Q. (By Mr. Jenks.) The price of refined oil in the table is the average export price? A. Yes.

Q. Export prices fix the price of domestic refined? A. Substantially so.

Q. Can you furnish to the commission also a list of prices of refined water-white oil in the oil markets of New York, Chicago, and Cincinnati? A. If you will give me a memorandum of that I will.

Pennsylvania oil, stocks, and prices.

Year	Average daily product	Average price per barrel	Export price refined, per gallon	Stocks increased	Stocks decreased	Total stocks
	Barrels.		*Cents.*	*Barrels.*	*Barrels.*	*Barrels.*
1870	15,350	$3.90	26⅜	203,872	.....	544,626
1871	15,800	4.40	24¼	.....	12,626	532,000
1872	17,925	2.75	23⅝	552,223	.....	1,084,423
1873	27,106	1.80	18¼	541,134	.....	1,625,157
1874	29,937	1.15	13	2,080,462	.....	3,705,639
1875	24,075	1.24¾	13	.....	155,439	3,550,200
1876	24,505	2.57⅝	19⅛	.....	725,461	2,824,739
1877	35,988	2.39⅜	15¾	303,098	.....	3,127,837
1878	41,544	1.17⅛	10¾	1,487,463	.....	4,615,300
1879	54,206	.85⅝	8⅛	3,936,956	.....	8,552,256
1880	71,114	.94⅛	9⅛	8,592,848	.....	17,145,104
1881	75,004	.85¼	8	8,615,947	.....	25,761,051
1882	82,338	.78½	7⅜	8,574,093	.....	34,335,144
1883	63,365	1.05⅞	8⅛	1,380,421	.....	35,715,565
1884	65,129	.83⅝	8¼	1,157,327	.....	36,872,892
1885	56,921	.88⅜	8⅛	.....	3,333,854	33,539,038
1886	70,679	.71⅜	7⅛	.....	171,140	33,367,898
1887	58,846	.66⅝	6¾	.....	5,011,786	28,357,112
1888	45,058	.87	7½	.....	9,752,638	18,604,474
1889	58,869	.94⅛	7⅛	.....	7,699,681	10,904,793
1890	82,376	.86⅝	7⅜	.....	1,609,279	9,295,514
1891	98,191	.66⅞	6⅞	6,047,719	.....	15,343,233
1892	91,328	.55½	6.07	2,052,155	.....	17,395,389
1893	85,296	.64	5.24	.....	5,284,206	12,111,183
1894	84,334	.83¾	5.19	.....	5,774,406	6,336,777
1895	84,820	1.35¼	7.36	.....	1,174,872	5,161,905
1896	92,815	1.19	6.98	4,488,678	.....	9,550,583
1897	96,357	.78⅜	5.91	1,239,069	.....	10,789,652
1898	85,206	.91⅛	6.31	752,101	.....	11,541,753

Since 1870 the daily production has increased per cent, and the price of refined about 75½ per 450 per cent, the price of crude oil has declined 75 cent.

Average prices received for deliveries of standard white illuminating oils at New York City, Chicago, Ill., and Cincinnati, Ohio, during years 1885 to 1899, inclusive.

[Prices given are cents per gallon in bulk, exclusive of the package; 2½ cents per gallon added will give average price, including barrel.]

NEW YORK CITY.

Month	Year														
	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
January	6.16	6.40	5.63	5.39	5.62	4.66	4.47	3.86	5.30	4.03	4.50	4.99	3.30	3.05	4.28
February	6.09	6.47	5.52	5.49	5.57	4.87	4.44	3.77	5.01	4.00	4.42	4.83	3.31	3.09	4.34
March	5.96	6.12	5.45	5.44	5.44	4.63	4.42	3.88	4.87	3.73	4.50	4.78	3.43	3.80	4.01
April	6.03	5.90	5.09	5.55	5.17	4.54	4.48	3.77	5.42	4.92	6.53	4.49	3.53	3.62	4.08
May	6.69	5.89	5.21	5.54	5.01	4.40	4.44	3.57	5.33	4.26	4.96	4.09	3.54	3.62	4.05
June	6.02	5.59	4.73	5.56	4.82	4.32	4.18	3.08	5.10	4.73	4.55	4.40	3.55	3.53	3.98
July	5.88	5.76	4.85	5.47	4.81	4.72	4.13	3.29	5.07	4.29	4.49	3.60	3.31	3.96	....
August	6.08	5.65	4.71	4.52	4.81	4.81	3.96	3.25	5.09	3.88	3.79	3.47	3.30	4.05	....
September	6.11	5.62	4.67	4.73	4.78	4.81	4.08	3.26	4.66	3.87	3.80	3.32	3.14	4.02	....
October	6.35	5.46	4.61	4.81	4.72	4.85	3.97	3.27	4.48	3.87	3.81	3.70	3.04	4.22	....
November	6.51	5.41	4.67	5.03	4.83	4.87	3.99	4.09	4.34	3.81	4.65	3.74	3.05	4.10	....
December	6.47	5.43	4.94	5.10	4.77	4.69	3.70	4.37	3.71	3.78	5.06	3.44	3.25	4.15	....
Total year	6.21	5.77	5.01	5.01	5.01	4.67	4.16	3.61	4.78	4.07	4.56	3.96	3.31	3.79	....

CHICAGO, ILL.

Month	Year														
	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
January	4.83	6.08	4.88	5.31	5.13	5.03	4.05	3.82	3.51	3.58	3.17	4.99	3.06	2.77	3.80
February	4.88	6.00	4.90	5.51	5.22	4.83	4.34	3.72	2.63	3.69	3.69	4.52	3.00	2.82	3.81
March	5.07	5.56	4.71	5.40	5.23	4.81	4.04	3.74	3.57	3.57	4.08	4.12	2.99	2.97	3.60
April	5.00	5.37	4.74	5.13	5.17	4.81	4.01	3.38	3.47	3.54	4.85	3.89	3.03	3.09	3.53
May	4.93	5.19	4.68	5.03	5.07	4.94	4.08	3.28	3.75	3.24	3.91	3.75	2.84	3.04	3.52
June	4.86	5.02	4.70	4.93	5.07	4.82	4.06	3.28	3.70	3.51	4.06	3.47	2.79	3.04	3.52
July	5.20	4.98	4.59	4.92	5.02	4.56	4.06	3.42	3.65	3.15	3.64	3.18	2.77	3.03	....
August	5.27	4.97	4.52	4.70	5.20	4.30	3.89	3.34	3.69	3.51	3.25	3.25	2.79	3.03	....
September	5.51	4.95	4.53	5.03	5.25	4.33	4.13	3.29	3.64	3.72	3.26	3.31	2.80	3.19	....
October	5.70	4.93	4.50	5.35	5.23	4.34	3.97	3.38	3.56	3.47	3.74	3.24	2.53	3.43	....
November	6.04	4.88	4.79	5.18	5.08	4.97	4.03	3.40	3.63	3.54	4.41	3.09	2.78	3.49	....
December	6.09	4.96	4.92	5.01	5.21	4.18	4.04	3.40	3.80	3.36	4.89	3.13	2.80	3.50	....
Total year	5.40	5.23	4.67	5.14	5.16	4.59	4.01	3.48	3.57	3.57	3.96	3.65	2.93	3.29	....

CINCINNATI, OHIO.

Month	Year														
	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
January	4.56	5.81	4.61	5.04	4.86	4.65	3.99	3.32	3.33	3.06	3.11	4.70	2.82	2.67	3.68
February	4.61	5.73	4.63	5.24	4.95	4.40	3.77	3.32	3.33	3.09	3.30	4.31	2.82	2.67	3.68
March	4.80	5.29	4.44	5.13	4.96	4.40	3.50	3.32	3.33	3.08	3.82	3.99	2.82	2.98	3.44
April	4.73	5.10	4.47	4.86	4.90	4.30	3.40	3.32	3.33	3.07	5.95	3.84	2.65	2.92	3.43
May	4.66	4.92	4.41	4.76	4.80	4.20	3.48	3.33	3.33	3.02	5.08	3.46	2.59	2.91	3.40
June	4.59	4.75	4.43	4.66	4.81	4.20	3.55	3.33	3.16	3.07	4.87	3.07	2.62	2.91	3.40
July	4.93	4.71	4.32	4.65	4.75	4.20	3.50	3.31	3.05	3.06	4.32	3.15	2.80	2.91	....
August	5.00	4.70	4.25	4.43	4.93	4.17	3.62	3.34	3.03	3.02	3.81	3.09	2.80	2.89	....
September	5.24	4.68	4.26	4.76	4.98	4.12	3.47	3.33	3.05	3.05	3.83	3.07	2.65	3.06	....
October	5.43	4.66	4.23	5.08	4.96	4.02	3.33	3.25	3.0.	3.03	3.84	2.98	2.61	3.32	....
November	5.77	4.61	4.52	4.91	4.81	4.02	3.34	3.31	3.08	3.06	4.18	2.83	2.65	3.32	....
December	5.82	4.69	4.65	4.74	4.94	4.02	3.33	3.33	3.07	3.09	4.82	2.85	2.64	3.45	....
Total year	5.13	4.96	4.40	4.87	4.89	4.18	3.52	3.31	3.18	3.06	4.12	3.46	2.71	3.07	....

Whereupon the commission, at 1 o'clock p. m., took a recess until 2 o'clock.

INDEPENDENTS WANTED TO COMBINE WITH THE STANDARD.

Q. (By Mr. Phillips.) Will you continue your statement? A. I will, with pleasure. I desire to make a word of explanation. Senator Lee has called my attention to the fact that in his opinion my testimony indicated that his approach to us with reference to their business was with a view to selling their properties. I did not mean so to state. His approach to us was with a view to combination. I supposed I had so clearly stated it; I make this statement in the fear I did not.

Q. Was it in regard to combination, or was it just not to be interfered with in getting a line through to New York—the right to live, rather than the combination; was it not put in that form? A. My understanding of it was, as I have stated, a combination.

MR. THEODORE F. DAVIS.

I take up further the testimony of Mr. Theodore F. Davis, of Marietta, Ohio. It is a trifle difficult for us to understand why this gentleman should have appeared before you; he certainly had no experience in the refining of oil, or as an owner of a refinery, that would at all qualify him to appear before you as a witness on this important subject. He has had an interest in a little alleged refinery at Marietta, which he bought when he was somewhat in politics. He immediately approached us to sell the property. We declined to buy it, on the ground that it was valueless as a working plant and had no value as competition; and I had forgotten that there was such a thing until his appearance here. Immediately after his appearance before you he evidently thought he had again made himself prominent enough to succeed in selling it, and he came to me in New York offering to sell this property. I will submit a letter from him on the subject, and my reply thereto, which covers all that need be said of this case. I think the only possible explanation on this matter with reference to his appearance is, that he came at Mr. Monnett's invitation as one of his combination. His letter was written after his interview with me; my reply, as you will see, immediately followed it. His letter is dated July 13, 1899; his appearance here before you was on June 9, 1899.

"I called on you about two weeks ago with letter of introduction from——— ———, and I presented the matter of negotiation for my refinery property at this place. You made memorandum of it and stated that you would present the matter to your people soon after the 4th of July, and as I have not heard from you, presume you have overlooked it. I have permitted one option to expire and have declined the proposition of another party to negotiate for them, not intimating why I do so, which is my appointment with you in regard to the matter. Please indicate your desire in regard to whether you are inclined or desire to further consider the negotiation. I, as stated, much prefer dealing with your people than with others, yet do not want to let the favorable conditions pass by. Hoping to hear from you soon.

"Very truly, yours,

"Theo. F. Davis."

To which I replied, under date of July 18:

"I am duly in receipt of your favor of July 13. I beg to return you herewith the schedule of refinery property which you left with me. The property is of such a character as to be without value to us, and we do not care, therefore, to buy it.

"Appreciating your expression that you prefer to sell the property to us rather than to other buyers, I am,

"Truly yours,

"Jno. D. Archbold."

I do not suppose it is at all necessary to take up any further statements regarding this gentleman. I have an interesting letter here regarding him from his partner in the refining business, but I will not read it unless you ask it to be read.

Q. What do you say about reading this letter? A. It is a personal letter, but I can read that part of it referring to the matter. It is from Mr. Macdonald, and he authorized me to use it if I cared to. Some parts of it are so personal that under suggestions made here I would not read them.

Q. (By Mr. Clarke.) What is your purpose? A. Nothing, except to show the character of the gentleman in relation to the refining trade, appearing here as one having knowledge.

Mr. Phillips. Without objection, the letter will be read, omitting the personal parts.

The Witness. The letter is dated Newark, Ohio, July 17, 1899, and is from George T. Macdonald.

(Witness at this point read the letter.)

MR. T. B. WESTGATE—THE PURE OIL COMPANY IN NEW YORK.

I have to answer next concerning T. B. Westgate. Mr. Westgate begins by going over substantially the same ground with reference to the advent of the Pure Oil Company in Greater New York, which has already been covered in the testimony of Mr. Lee.

IMITATING BRANDS AND COLORS.

He makes a statement charging that the Standard Oil Company imitated his yellow barrels and used his brands so that they might get trade which he had built up by the use of these barrels and brands as a special trade mark. I have carefully investigated that question, and I find it to be the fact that instead of our having attempted to use Mr. West-

gate's brands the real facts are he used our brands. The yellow brand, as defining a certain quality of oil, had been in use by us in that territory for many years before Mr. Westgate appeared there, and when he came he adopted our yellow barrel so as to facilitate his chances for getting business. I deny emphatically that we have ever used his barrels and brands, and assert that he did use ours.

Q. (By Mr. Jenks.) That he used your brands? A. That he used our color. I deny his statement with reference to both, and charge in turn that he used our barrels.

Q. (By Mr. Smyth.) How about the charge of using their brands? A. It is absolutely untrue; absolutely and unqualifiedly untrue.

Q. (By Mr. Jenks.) The statement was made here, I believe, that you had used the brand "Sunlight Doubly Refined," but put your name on the outside of the circle, which would not be an exact imitation, but would be using the name that he was using for his oil? A. No; I deny the whole matter in toto.

Q. You had yourselves been using barrels of that same color before he began selling in that territory? A. I know so, because I had to do business in that section and with the company who made the yellow barrels, and knew all about it.

COMPETITION AT FULTON, N. Y.

Q. In regard to the statement about Fulton, N. Y.? A. The facts are that he first enticed away from us the man Crandall to whom he refers. He began a campaign against our trade by cutting prices. We, in self-defense, finally put on another seller of oil to compete with him and to regain our lost trade.

CHARLES FREY, OF HOBOKEN—ALLEGED PRICE AGREEMENT.

He goes with great particularity into the case of Charles Frey, of Hoboken, N. J., whom he characterizes as a German with Bismarckian blood in him, who had threatened us with dynamite, etc. I carefully investigated the case, having talked personally with our Jersey City agent, who was our agent at the period mentioned by Mr. Westgate. He denies emphatically ever having made any such threat toward Mr. Frey as Mr. Westgate testified to, or ever having had any understanding with him as to prices in connection with the marketing of Mr. Westgate's oil or any competitive oil, as Mr. Westgate testifies. As a matter of fact, the man Frey was a customer of ours to a considerable extent, having bought in the year 1890, his principal supplies from us; he was a man of violent temper, an avowed anarchist; he has not been in the business for a number of years now, although Mr. Westgate's testimony would carry the impression that he has continued to help him in the sale of oil at Hoboken. The last known of him was that he was running a saloon in Brooklyn.

UNDERBILLING OF TANK CARS.

Mr. Westgate alleges at great length and with some particularity the underbilling of tank cars, citing, as a special case of which he had special knowledge, shipments from Olean, to points eastward.

I beg to present to you here letters from the officials of the Western New York and Pennsylvania Railroad and the Erie Railroad, being the only two lines out of Olean, on that subject. I will read, first if you please, the letter of Mr. Edward T. Johnson, general freight agent of the Western New York and Pennsylvania Railway Company, dated at Buffalo, August 10, 1899, addressed to me.

"My attention has been called to the testimony of Mr. Theodore B. Westgate (who I think is a refiner from Titusville, Pa.), before the Industrial Commission of Washington, in which he testified that it was his belief that shipments of the Standard Oil Company from Olean, N. Y., in tank cars, were billed at a weight less than the actual contents of same.

"In answer to Mr. Westgate's testimony I would say that I have investigated the matter, and of my own knowledge am positive that there is no arrangement of this kind now, nor has there ever been at ay time heretofore, between this company and the Standard Oil Company, or its representatives. On the contrary, I do know that on all oil shipments from Olean, where the weights have been per 100 pounds, we have charged and collected freight on the full capacity of the tank cars, based on, first, 6.3 pounds to the gallon, subsequently on 6.4 pounds to the gallon, the change at Olean being made at the same time that it was put in force over the entire Western New York and Pennsylvania Railway. Where the weights have been per barrel we have charged and collected freight on basis of maximum number of barrels that the tank could contain. It is possible that in view of the hundreds of cars of oil that are shipped from Olean some clerical errors have been made by which the weight of a car on the freight bill may have been misstated, but if so it has been made by clerical error only, and not by arrangement with the Standard Oil Company or any of its representatives.

"If it will be of any service to you I will be glad to put the above in the form of an affidavit, or will appear before any United States commissioner and testify in regard to same.

"Yours truly,

"Edwd. T. Johnson,
"General Freight Agent.

For the Erie road, dated at New York, August 29, 1899, addressed to me by George G. Cochran, fourth vice president:

"Referring to Mr. Harriott's letter to you of the 28th inst., in regard to weights on oil.

"I was traffic manager of the Erie lines from January, 1892, until March, 1896, and concur fully for this period in what Mr. Harriott says. The weight of 6.4 pounds per gallon was maintained

from the date of its adoption; previously, the average weight applied was 6.3 pounds per gallon.

"Yours truly,

"Geo. G. Cochran,
"Fourth Vice President.

Also the letter of Frank Harriott, general freight traffic manager of the Erie road:

"In regard to the testimony given before the Industrial Commission in Washington, June 8, 1899, by Mr. Theodore B. Westgate, of Titusville, in which he alleged that on shipments of the Standard Oil Company from Olean, N. Y., tank cars were billed at less than their actual weight, and in this way an advantage was given the Standard Oil Company over other shippers, I beg to say that for three years I have been in charge of traffic matters, covering shipments from Olean and other points on the line of the Erie Railroad, and I can state positively that there is not now, nor has there ever been, an arrangement between this company and the Standard Oil Company, or any of its agents, of a nature testified to by Mr. Westgate. On the contrary, I know that on all oil shipments from Olean, as well as from all other points on the Erie Railroad where our tariff rates are 'per 100 pounds,' we have charged and collected freight on the full-weight capacity of the tank car, based on 6.4 pounds per gallon, and in a few instances where rates have been 'per barrel,' we have charged and collected freight on the basis of the maximum number of barrels that the tank car held; and that this has been true on all shipments made by the Standard Oil Company, as well as by all other shippers.

"You are authorized to use this letter in any way that you may think best, and if I can furnish you any further information, I will be glad to do so.

"Yours truly,

"Frank Harriott,
"General Freight Traffic Manager.

I desire to submit also a pamphlet, a book known as the Tank Gauge Handbook, which covers by numbers every tank car with its full capacity that is in use in our business, and which is in the hands of every railroad organization over which we make shipments; and which I want to state positively that we have no understanding, and never have had, with any railroad, with reference to the underbilling of any car.

Q. (By Mr. Jenks.) You state you have in your freight business paid full weights according to the schedules given in this pamphlet? A. According to the schedules given in this pamphlet.

Q. These two railroads from which you have supplied letters are the only ones out of Olean? A. They are the only ones out of Olean. The concluding part of Mr. Westgate's testimony, with reference to railroad discriminations, is covered in the statement already made in reference to the same question in Mr. Lee's testimony; namely, that the cases pending in the United States court are to recover freight which the railroads charge all shippers on barrels. The Interstate Commerce Commission decided that railroads should carry barrels free, and the railroads, refusing to accede to such a decision, are testing the question in the United States court. A final decision will interest us to a larger extent than all other shippers.

THREAT TO CUT PRICES AT SOUTH BEND, WASH.

Q. (By Mr. Jenks.) Mr. Westgate presented a letter from Portland, Oreg. which he put in evidence, with reference to some statements made by the special agent of the Standard Oil Company. The essential part of it is this: "You can rest assured that if another car load of Sunlight oil arrives at your place, it will be sold very cheap. We do not propose to allow another carload to come into that territory, unless it comes and is put on the market at one-half its actual cost. You can convey this idea to the young man who imported the carload of Sunlight oil." Signed by George C. Flanders, of the Standard Oil Company. The question is whether in competitive territory your people are authorized and instructed to make statements of that kind? A. If any such statement was made, it was a foolish statement by a foolish and unwise man, and in our thousands of employes we do have some. The statement had missed my attention, if it was in my copy, or I should have investigated it.

Q. I will give you a specific reference to it: It is, Portland, Oreg.; George C. Flanders, special agent. A. I will say again the gentleman had no such instructions; any such statement as that was unauthorized and unwise.

[The following letter, with the annexed newspaper clipping, was subsequently submitted by the witness:]

26 Broadway, New York, October 27, 1899.

Dear Sir: Referring to the letter submitted to the Industrial Commission at Washington, written by George C. Flanders, from Portland, Oreg., to a merchant at Southbend, Wash., and to which you call my attention. While the Standard Oil Company does not compete with other merchants for business, it is done, though, on the basis of a fair margin of profit, and Mr. Flanders did not have any authority to write that oil would be sold on the basis mentioned in his letter. The letter was written some years ago (in March, 1894), and was intended to be written in a jocular manner to deny a claim that he was selling an oil inferior in quality to that sold by others. The Standard Oil Company is at times unjustly accused of doing this, as is evidenced by the enclosed article taken from a Los Angeles paper, and a wrong construction might be put on a letter written to refute a claim of this kind.

Yours truly,

H M. Tilford.

J. D. Archbold,
26 Broadway, New York.

ASSASSINATION KEROSENE.

Pomona, Oct. 6.—[To the Editor of the Times:] To my positive knowledge 90 per cent of the kerosene sold in Pomona, Pasadena, Riverside, and Anaheim is a dangerously low-test oil. To sell kerosene for domestic use under a test of 120 in the eastern states is punished by long terms of imprisonment and from $250 to $500 fine. There are no laws regulating this matter in southern California. The result is human life is sacrificed and many homes destroyed. The oil shipped into these towns by the Standard Oil Company and sold to the grocers, who in turn sell it to the public as the best eastern kerosene. By actual tests I find the lowest grade used about buildings of the Santa Fe Railroad Company is 150 fire, and that sold by the Standard Oil Company to the grocers of those towns as follows: Elain, in cans and cases, 118 to 120 fire; Pratt's Astral, in cans and cases, 98 to 104 fire; Pearl, in cans and cases, 98 to 104 fire; Eastern, in bulk, 98 to 104 fire. The meaning of the fire test is at what temperature Fahrenheit will the oil throw off an explosive gas. An ordinary lamp often attains a temperature of 120 degrees. Therefore, any oil that will throw off this gas under that temperature is termed by oil men "Assassination Oil." With these facts in view, is it any wonder that lamps explode and human life is sacrificed? In the name of humanity, cannot the public be protected from this dangerous imposition?

W. S. Walker.

PROSPEROUS OIL PRODUCERS.

I will take up the testimony of Mr. Lockwood. Mr. Lockwood says: "The Standard Oil Company have driven into financial obscurity, bankruptcy, or servitude the men whose energy and enterprise have developed this great oil producing and refining industry of America." I hand you a statement, made so much in detail that I will not attempt to weary you with its reading, of producers who have been prominent in the business in what is known as the Pennsylvania oil producing section—the section Mr. Lockwood was treating of.

Q. (By Mr. Smyth.) How many names? A. There are hundreds of them; I have not figured it up—about 800.

Q. (By Mr. Kennedy.) Is Mr. Lockwood's name in the list? A. I suppose it is.

Q. Are they arranged alphabetically? A. Yes; I see they have omitted Mr. Lockwood.

SOUTH IMPROVEMENT COMPANY.

I deny emphatically Mr. Lockwood's statement that everything contemplated to be done for the South Improvement Company has been done for the Standard Oil Company. As a matter of fact, the South Improvement Company never did any business, as Mr. Lockwood well knew, and the special features of exclusive freight contracts, which were contemplated in the South Improvement Company, were not attempted to be perpetuated by the people of the Standard Oil Company. It was at once recognized that that special feature was not defensible, and it was abandoned absolutely.

PIPE LINE CONSOLIDATION—COST OF PIPAGE.

Mr. Lockwood refers to the small pipe lines which sprang into existence in the early history of the oil business. They were inadequately capitalized in many cases; they were inefficient, and gave the producers such poor service that the remedy which was proposed, consolidation, was very gladly welcomed by the producing class as a whole. The result was the pipage was reduced from 40 cents, which was the prevailing price through the life of the small lines, to 30 cents, and after consolidation to 20 cents.

Q. About what time was the cost of pipage reduced to 20 cents? A. Shortly after the consolidation of the United Pipe Line system.

Q. Has the price lowered since? A. The price has remained at that figure.

Q. There has been no reduction in the cost of piping for many years, 20 years or so? A. No; it was considered a minimum price and has been considered a fair price.

Q. (By Mr. Smyth.) A universal price to all? A. A universal price to all comers.

Q. The cost of building, controlling, and managing, I presume, has lessened? A. It has lessened and increased. If you figure from today's standpoint it will be higher of course. The long distance involved in laying the lines to some of the fields, the field that Mr. Rogers spoke of—the West Virginia field—of course require extensive operations.

NO DISCRIMINATIONS SINCE THE INTERSTATE COMMERCE LAW.

Mr. Lockwood's statement that discriminations were continued in favor of the Standard Oil Company after the inter-state commerce law was passed, I desire to meet with absolute denial, and challenge him for any such record. He makes this statement, and then attempts to give it color by referring to a ridiculous case which he and some of his co-patriots had brought in Clarion county, Pennsylvania, nine years before the inter-state commerce law was passed. In connection with this case he goes to the length of accusing the supreme court of the State of Pennsylvania of violating the constitution in order to prevent a conviction of the Standard Oil people. The statement is so outrageous for a gentleman of his calling that it carries its own answer, and perhaps should have no further comment.

THE MATTHEWS-BUFFALO CASE.

Mr. Lockwood goes at great length into that so-called Matthews-Buffalo case. This case as first instituted attracted a great deal of attention. It has been made much of in the sensational press,

and has been made much of by careless writers, and I am very glad, indeed, of the opportunity to put this presentation on record in answer to the charges that Mr. Lockwood has made about the case and the sensational statements regarding it which he gave to the public through your hands. We shall be glad to go down, as repeated, exposing the sensational charges that have been made in connection with it. I will ,therefore, with your permission, read this statement:

"Mr. Lockwood attempts to make much of the so-called Matthews-Buffalo case.

"And indeed, gentlemen, this case has been more often and more thoroughly exploited in the way of misrepresentation, not only by men of Mr. Lockwood's type, but by careless writers of magazine articles, pamphlets, and books, than any other case, unless it be that of Rice. It is high time that a simple, succinct statement of the case should be made, and I am glad to make it.

"The simple facts are that in 1881 Matthews, with two others, were in the employ of the Vacuum Oil Company, of Rochester, N .Y. The executive officers of this company were Messrs. H. B. and C. M. Everest, of Rochester, who, with their friends, represented a large ownership in the stock of the company, and were by contract fully in control of the management of the business of the company. Messrs. Everest were not at that time, nor have they ever been interested in the stock of the Standard Oil Company. The Standard Oil Company were owners in the stock of the Vacuum Oil Company, but had no direct relation whatever with the management of its affairs. While still in the employ of the company Matthews and his two associates conspired together to leave the employ of the Vacuum Oil Company and establish a like business at Buffalo. To this end they had entered into a partnership arrangement, had prepared themselves by using the Vacuum Company's patents for castings of the material to be used in construction, had thoroughly familiarized themselves with all methods of manufacture and with the patrons of the Vacuum Oil Company, and in every way prepared themselves to take advantage of the various business processes—many of them covered by patents owned by the Vacuum Company. There is plenty of indisputable evidence that they did not expect their venture at Buffalo to really succeed on its merits, but then they believed that by so imitating the brands and processes of the Vacuum Company they would induce the latter to buy them out at a high price. As I say, there is plenty of evidence even including that of one of the parties who was to join with Matthews, a man named Miller, that they expected to be bought up by the Vacuum Oil Company or the Standard Oil Company. Efforts were also made by the Matthews party to entice away other important employes of the Vacuum Company. After the business was gotten under headway at Buffalo, and the infringements became evident, various suits were brought by the Vacuum Company against Matthews and his associates. During this period Miller, one of the Matthews party, solicited re-employment with the Vacuum Company, and finally, after considerable discussion, was re-employed. Later, having some disagreements with the Vacuum Company with reference to the question of his employment, he again coquetted with Matthews and the Buffalo party, and as a result of his statement before the grand jury as to what his intercourse had been with Messrs. Everest, and of other statements made before the grand jury charging Messrs. Everest and all the directors of the Vacuum Company, namely, Messrs. H. H. Rogers, A. M. McGregor and myself, with conspiring against the business of the Buffalo company. The evidence produced in the case clearly indicated a carefully concocted effort on the part of Matthews and his associates as against the Vacuum Company, and the balance of the testimony was tremendously in favor of the Vacuum Company. At the conclusion of the evidence for the prosecution the judge held, as he could not have held otherwise, that not a scintilla of evidence had been produced against the so-called Standard people, namely, Messrs. Rogers, McGregor and Archbold, and directed the jury to acquit them, which they did.

"As I have stated, the balance of the evidence in the case was so much against Matthews that it seems an act of gross injustice that the judge should have allowed the case against Messrs. Everest to go to the jury. The result of the trial was that the jury, plainly influenced by the cunning plea of the district attorney in behalf of the individual, Matthews, as against the so-called rich corporations, rendered a verdict against Messrs. Everest. Six of the jurors made affidavits, copies of which I attach hereto, that they only agreed to a verdict on the basis of the minor charge presented in the indictment, that of the enticing away from the Buffalo works of the man Miller by the Messrs. Everest. The judge imposed a fine, the largest permitted by the statute. As a matter of simple justice, the verdict should have been set aside entirely. All talk about the blowing up of the Buffalo works, which has been so much exploited by the yellow journals and by careless writers, is the purest fiction. There never was anything of the kind.

"With reference to Mr. Lockwood's statement that Matthews had verdicts against the Standard Oil Company people for civil damages for $270,000, I may say that the statement is as false as every other feature which he presents. An action was brought by Matthews for $20,000, and a sympathy verdict for that amount was rendered by the jury. Judge Baker promptly set the verdict aside as being excessive and on the ground that the jury were guided in their action by prejudice, passion or sympathy.

"Matthews brought further action for $250,000, which he never brought to trial. Any careful student of the case who will go thoroughly into the literature of the matter, which can be easily presented, will, after this lapse of all these years, reach no other conclusion than that Matthews and his associates, lay and professional, were engaged in an effort at extortion."

The following is the copy of the affidavit of six jurors, referred to above:

State of New York, County of Erie, ss:

Nicholas Demerly, of the town of Boston, John J. Kinney, Bernhard Schlebus, R. B. Musan, George W. Havens, John Ueblueher, being severally duly sworn, each for himself, deposes and says: That he was one of the jury that served on the trial of H. B. Everest and C. M. Everest for conspiracy in the Erie County Oyer and Terminer in May, 1887, that the said jury rendered a general verdict of guilty against both of said defendants. And deponent further says that, as he verily believes, it was not the intention of said jury, in rendering said general verdict, to pronounce the defendants guilty of an attempt or conspiracy to blow up or burn the works of the Buffalo Lubricating Oil Company, Limited, but the conviction was, in the mind of the deponent, based upon the enticement of the witness, Miller, from the employ of said oil company, and he believes that the other members of the jury convicted the prisoners on the same ground. And deponent further says that he believes the ends of justice will be met in this case by the imposition of a fine upon the defendants, and he therefore begs to recommend to the court that the sentence of said defendants be that they pay a fine only, and that they be not sentenced to imprisonment.

Nicholas H. Demerly.

Nicholas Demerly was sworn to before me this 21st day of April, 1888.

Subscribed and sworn to before me this 21st day of April, 1888.

Ryal C. Payne, Notary Public.

John J. Kinney.

John J. Kinney sworn to recommendation only. Sworn and subscribed before me this 31st day of April, 1888.

Jno. W. Fisher,
Notary Public, Erie County, N. Y.

Bernard Schlebus.

Subscribed and sworn to before me by Bernhard Schlebus this 30th day of April, 1888.

S. M. Welch, Jr.
Notary Public in and for Erie County, N. Y.

R. B. Mason.

Subscribed and sworn to before me this 2d day of May, 1888, by R. B. Mason.

S. M. Welch, Jr.,
Notary Public in and for Erie County.

George W. Havens.

Subscribed and sworn to before me this 2d day of May, 1888, by George W. Havens.

Frank S. Coit,
Notary Public in and for Erie County, N. Y.

John Ueblacker.

Signed by John Ueblacker in the presence of John F. Knapp.

State of New York, Erie County Clerk's Office, ss:

I, Otto H. Wende, clerk of said county, do hereby certify that I have compared the annexed copy of affidavit and copy indorsements thereon with an original and its indorsements entered and on file in this office, and find the same to be true transcripts of and from the said originals, and the whole of each thereof.

In witness whereof, I have hereunto set my hand and affixed the seal of said county, at Buffalo, this 29th day of August, A. D. 1899.

Otto H. Wende, Clerk.

Q. (By Mr. Jenks.) You have detailed records of the court which are at the disposal of the commission if they desire them? A. Yes.

Q. (By Mr. Faruhar.) After the finding of the court with respect to conspiracy in destroying the works, in the several actions for damages, I understood you to state that Matthews did not recover at all? A. After Judge Barker set it aside there never was any further case brought to trial. There was an action pending for $250,000, which was never brought to trial.

Q. (By Mr. Jenks.) Did Matthews make any settlement of any kind with those against whom judgment was awarded? He received no settlement at all? A. I do not know what his relations were with his lawyers. It seems, as far as I have recollection of the matter, that after the decision, in the final settlement of the matter, his lawyer partners got most of what was left. I do not know that that is a very exceptional thing, but it is true in that.

THREATEN THE INTERSTATE COMMERCE COMMISSION.

Mr. Lockwood makes the ridiculous statement that the "combines" had threatened the Interstate Commerce Commission. He evidently, in making this statement, desired to be understood that they had threatened it bodily, but this, I believe, he afterward disavowed.

THE CASE OF *MR. RICE.*

Mr. Lockwood goes at length into the Rice case and attempts to enlist the sympathy of the commission regarding Rice. I now desire, first, to present to the commission a full statement of the original Rice case, made by Mr. D. O'Day, before the committee of the House of Representatives in 1888, pages 273 to 276, inclusive. This statement covers the exact facts regarding the much talked of Rice case.

I would like to read Mr. O'Day's testimony, if I may make it a part of my testimony. I will try and limit it so as not to weary you unduly, reading that which pertains as directly as possible to the Rice case:

"Q. Do you remember the Cleveland and Marietta Railroad Company? A. I do.

"Q. You remember Mr. Pease was receiver. A. I met him once; yes, sir.

"Q. Did you have a conference with him upon the subject of making a rate over his railroad for crude oil? A. Yes, sir; but not for refined oil.

"Q. When was that? A. I think it was in 1882 or 1883.

"Q. Where did you desire that oil to be transported; from what point to what point? A. The arrangement that you speak of was not made with Mr. Pease. An arrangement was made with the managers of the Wheeling and Lake Erie Railroad, I think, who at that time controlled the Marietta railroad, which was continued after Mr. Pease, the receiver, was appointed. The arrangement consisted in making a through traffic with the railroad company of which the Macksburg line was a part. We made a connection from Marietta to a point south, the total arrangement of charge being divided between the railroad and the pipe line.

"Q. What rate did you get over that railroad for the transportation of oil? A. To where?

"Q. For the distance it passed over the road? A. A good deal of oil was transported from Marietta to Cleveland. The bulk of it was transferred south to Marietta and Parkersburg.

"Q. At what rate? A. I think the through pipage rate and rail rate was 35 cents, as I recollect it.

"Q. What part of that did the railroad company get? A. I have forgotten what the divisions were. My recollection is it was 20 and 15 cents.

"Q. Was it not 10 cents? A. I can not say, sir; I cannot be positive.

"Q. I will read the following to you to aid your recollection. It is an extract of a letter to Mr. Rappello, general counsel of the receiver ,and signed by P. Pease. He states that—

" 'Mr. O'Day, manager of the Standard Oil Company, met the general freight agent of the Wheeling and Lake Erie railroad and our Mr. Terry at Toledo about February 12 and made an agreement (verbal) to carry their oil at 10 cents per barrel. But Mr. O'Day compelled Mr. Terry to make a 35-cent rate on all other oil going to Marietta, and that we should make the rebate of 25 cents per barrel on all oil shipped by other parties, and that the rebate should be paid over to them (The Standard Oil Company), thus giving us 10 cents per barrel for all oil shipped to Marietta, and the rebate of 25 cents per barrel going to the Standard Oil Company, making that company, say, $25 per day clear money on Mr. George Rice's oil alone.'

"State whether that is a true statement. A. It is not a true statement.

"Q. In what respect? A. In the respect, first, of the divisions. It may be true regarding that, but I am not sure of that; I do not recall it well enough to know. It is not a true statement that we compelled the road in any sense to do anything of the kind.

"Q. Were you not under your agreement to have your oil transported from Marietta over the railroad at 10 cents a barrel. A. We had an arrangement by which the through rate from the wells, which included the pipage charge, was to be a certain figure, and was to be divided between the railroads and ourselves.

"Q. What share did the railroad get? A. My recollection, which is rather hearsay, was 20 cents pipage rate and the railroad 15 cents.

"Q. And not 10 cents? A. I do not want to be positive of that.

"By the Chairman:

"Q. Does that rate which you give include your local pipage, too? A. Yes, sir.

"By Mr. Gowen:

"Q. Where did this oil strike the railroad? A. At a place known as Macksburg.

"Q. Went from there to Marietta, Ohio? A. Yes, sir.

"Q. Now, I ask you if the rate which the railroad received out of this joint rate was not only 10 cents a barrel? A. My recollection is, as I said before, 15 cents. I won't be positive of that.

"Q. Would you assert your recollection against a judicial determination of this question by the court? A. I certainly should not.

"Q. Now, did you not make it as a part of that arrangement that this railroad company, or its receiver or manager, should charge a certain Mr. George Rice, who was a competitor with you, a higher rate on his oil? A. No, sir.

"Q. You did not? A. We did not.

"Q. Were you not to receive, and did you not receive from this railroad or its business a payment to your company on account of the oil they transported for Mr. George Rice? A. Yes, sir; the railroad company agreed that the rates should cover all oil transported.

"Q. What rate? A. The fixed rate as between the railroad and the pipe line.

"Q. That is to say, that when the through rate of 35 cents was charged on the oil which passed through your pipe line and their railroad together and out of which you received 20 or 25 cents, as your recollection may be, they were to charge the same rate to Mr. George Rice, whose oil passed only over their railroad and not through your pipe line? A. There was nothing special about George Rice; it covered the oil.

"Q. But did that other oil which was in competition with you pass through your pipe line? A. No, sir.

DRAWBACK ON OTHERS' OIL RETURNED BY ADVICE OF COUNSEL.

"Q. Did not they, therefore, on that oil which only passed over the railroad and not through your pipe line pay to you the same allowance or rebate that they did on your oil which did pass? A. They did, but we returned it, through the advice of our counsel, Mr. Dodd.

"Q. How long did you keep it? A. A very short time.

"Q. It was a hot time for Mr. Rice? A. I don't think it was; he was a hot man.

"Q. The result of that arrangement, if it had been carried out—assuming your recollection to be correct—you would have paid 15 cents to the railroad for your oil and Mr. Rice would have paid 35 cents, would he not? A. No, sir; he had the privilege of doing what he did, which he afterwards did do.

"Q. He was not using your pipe line? A. No, sir; we tried to get him to make an arrangement with us to use our pipe line, but he would not do it; he wanted a better rebate than anybody else.

"Q. He had his own means of bringing this oil to the railroad; he did not require your pipe for that service? A. He required the pipe to get his oil to Marietta, and subsequently laid a pipe to Marietta.

"Q. Was not this the fact, that Judge Baxter has found in this case, that Mr. Rice, who at that time only used the railroad, paid 35 cents for the transportation of a barrel of oil? Was not that true? A. I took it to be true.

"Q. Now, out of that sum how much did you get from the railroad out of what they received from Mr. Rice? A. We did not get any; that is, we did not retain any. The railroad company agreed to account to us for the oil that went over its lines, and they did make an accounting, to my recollection, of about $200 or $250, or something like that, on oil other than that which passed through our lines. Our counsel, Mr. Dodd, advised me that we could not do that business, and we refunded the money.

"Q. Was that refunded before the investigation of the case took place in court? A. I do not know; I do not remember.

"Mr. Buchanan. Before this examination proceeds any further, I wish to say that the use of the terms 'in court' and 'Judge Baxter' indicates to me that there has been litigation upon this subject between Mr. Rice and some company. I would like to know before the examination goes any further whether there has been such litigation between Mr. Rice and any company represented by or that would be bound by the statements of the witness now upon the stand; and second, whether, if such litigation has been had, it is concluded and the matter disposed of in the courts, or is in any way still pending. I ask this question solely for information, because I do not know anything about the matter.

"Mr. Gowen. No, sir; the proceedings are entirely completed. It was not a suit between Mr. Rice and anybody. It was a proceeding against the receiver of this road to dismiss him from his receivership. That has been terminated. It has been dismissed, the case is ended, and reported in the Federal Reporter.

"Mr. Smith. Who rendered that decision?

"Mr. Gowen. Judge Baxter. He removed him.

"Mr. Smith. Was he judge of the United States court?

"Mr. Gowen. He was judge of the circuit court for the southern district of Ohio.

"Mr. Smith. A United States court?

"Mr. Gowen. Yes, sir.

"The Chairman. I understand, in answer to Mr. Buchanan, the information is furnished that there was a proceeding pending to remove a receiver; that proceeding resulted in the finding by the court removing him, and that litigation is closed.

"Mr. Gowen. That branch of the litigation is closed.

"Mr. Buchanan. That answers my inquiry. But there has been another remark made that leads me to ask if there is any other branch of the case remaining unclosed?

"Mr. Gowen. Only this: The jurisdiction that the United States court was enabled to take over this case arose from the fact that a receiver had been appointed in a proceeding in that court to foreclose the mortgage, and therefore as the receiver was an officer of that court, the court took jurisdiction of this question. Whether the proceeding to foreclose the mortgage is ended or not I do not know.

"Mr. Buchanan. That answers my question.

"Mr. Gowen. There is no other suit pending about it that I know of.

"By Mr. Gowen:

"Q. Where did this oil that was transported over this railroad to Marietta originate? A. In the country in and about Macksburg.

"Q. Ohio? A. Yes, sir.

"Q. There is a small oil field near the Macksburg field in southeastern Ohio? A. Yes, sir.

"Q. How far is that field from the Ohio river? A. Perhaps 15 or 20 miles; somewhere along there.

"Q. The largest town near to it on the Ohio is Marietta? A. Yes, sir; south.

"By Mr. Smith:

"Q. You stated that the charges on oil were lost in trying to get the business, if my memory serves me right? A. Very largely.

"Q. How were they lost? A. In competition in buying the oil—bidding for the oil.

"Q. Bidding for the oil? A. Yes, sir.

"Q. Did you have to purchase of somebody?. A. We had to purchase oil."

That covers the record of the case as given under the sworn testimony of Mr. O'Day, who had to do with it on behalf of our interests at the time, and I now state further, on careful personal inquiry of Mr. O'Day, he informs me that the amount involved in the Rice contract, some $200 or $250, was immediately, under Mr. Dodd's instructions, refunded, and that such refunding was made before any proceedings were instituted as against the receiver. We were in no sense a party to the proceeding against the receiver; were not present in court when the matter was heard, and had nothing whatever to do with it.

MR. RICE NOT A REFINER OF LATE YEARS, BUT AN AGITATOR.

I desire to state further, from my own personal knowledge, that Rice's efforts for many years have been directed, not toward making a success of his refining business, but to the pursuit of such a vexations course toward us as would lead us to buy him out of the business at an exorbitant price. In other words, his course for many years has been a direct effort toward extortion. In a personal interview which I had with him, on his request, as far back as 1886, he demanded of me that we pay him $250,000 in cash and $50,000 per year for five years, or a total of $500,000, for his Marietta refinery, which was worth at that time possibly $25,000 or $30,000. He based this demand on the statement that he had already inaugurated a number of suits before the Interstate Commerce Commission, that he could influence the action of the commission, and had other suits in contemplation which he would at once press unless we submitted to his demand. He claimed that if we did make the deal with him he could influence the discontinuance of the suits already pending, and that he would refrain from bringing others. He further stated that he had the ability to cost us a very large amount every year by making what he termed "cut quotations" in the markets for refined oil, thereby unsettling the trade and compelling us to make concessions to our customers in the localities affected. I drew him out as much as possible on this subject in the hope of getting him to expose his plans as thoroughly as possible, and then asked for time in order to make investigations of his statements. He evidently realized, after some delay in the matter, that we had not been specially influenced by his statements, and the matter was allowed to drop. Later, however, he made further efforts in the same line.

Rice has had no active relation with the business nor made any effort to have any for many years. I can not say positively, but I believe that he has been supported as an agitator by our enemies and those seeking in this indirect and underhand way to annoy us.

MR. LLOYD—WEALTH VS. COMMONWEALTH.

I desire to say a word regarding the effort at pathetic reference of Mr. Lockwood to the Rice case in Lloyd's book. I desire to characterize this statement in Mr. Lloyd's book, as well, indeed, as all the other statements with reference to our business, as cunning fiction, made up entirely on one-sided testimony and dressed for sale. Whether Mr. Lloyd expected to share, as a result of his advocacy of Rice, in what Mr. Rice might be able to get from us, I am unable to say, but he certainly lays himself open to that suspicion.

I desire to say further with reference to this book of Mr. Lloyd's, that if you are disposed to waste your time reading it you will find it with reference to its statements regarding the business of the Standard Oil Company one of the most untruthful, distorted compilations that was ever inflicted on a suffering public.

Q. (By Mr. Farquhar.) Will you state the title of the book? A. Wealth vs. Commonwealth.

PRICES FOR EXPORTS AND IN NON-COMPETITIVE HOME MARKETS.

Mr. Lockwood makes an absurd statement, intended to convey the impression that at the same time refined oil is sold to Germany at two cents a gallon, the people of Texas and Arkansas are forced to pay 25 cents. There is, of course, not a word of truth in any such statement, nor does he pretend to furnish, nor can he offer, any evidence in support of it. It is the sort of statement that a silly demagogue would make in an effort to create sentiment on this question.

With reference to the course of production and present competitive prices, Mr. Lockwood makes the startling admission that he himself at one time aspired to be a monopolist and plutocrat. We can not escape a shudder at the thought of such a thing.

SOUTH IMPROVEMENT COMPANY.

He makes an absurd statement regarding the railroad companies raising the price of crude oil from 40 cents to 80 cents and paying the additional 40 cents to the South Improvement Company. There is not a shadow of basis to support it. He convicts himself with reference to this matter by testifying that the South Improvement Company was not carried out. As a matter of fact, I repeat that they never did any business.

THE STANDARD'S CONTROL OF REFINING.

Mr. Lockwood testifies:

"Q. By Mr. Kennedy.) Mr. Lockwood, can you state, approximately, what per cent of the refined oil of this country is turned out by the independent companies? A. We calculate that they are handling about 4 per cent.

"Q. Only 4 per cent? A. Only 4 per cent; you know this is an immense business.

"Q. (By Mr. Phillips.) That is, taking the Ohio oil? A. Taking the Ohio oil and the Pennsylvania oil and these different grades of oil."

I will now present a statement showing the aggregate business done by the Standard Oil Company and by others in the United States for the five years, 1894 to 1898, inclusive, in which it appears that the aggregate percentage of all business in petroleum and its products done by the Standard Oil Company was 82 3-10 for this period of five years as against competitors 17 7-10.

Q. (By Mr. Smith.) That includes all by-products. A. Petroleum and all its products.

Business of Standard Oil Company and other refiners, years 1894 to 1898, inclusive.

[Barrels of 50 gallons. All products, domestic trade.]

Year	Standard Oil Co.		Others		Total
	Barrels	Per cent of total	Barrels	Per cent of total	Barrels
1894 ...	18,118,933	81.4	4,145,232	18.6	22,264,165
1895 ...	18,348,051	81.8	4,084,720	18.2	22,432,771
1896 ...	16,341,161	82.1	3,569,719	17.9	19,910,880
1897 ...	18,141,479	82.4	3,876,706	17.6	22,018,185
1898 ...	19,999,939	83.7	3,914,999	16.3	23,914,938
Total.	90,949,563	82.3	19,591,376	17.7	110,540,939

THE STANDARD'S CONTROL OF PRODUCTION.

Mr. Lockwood testifies that by manipulation of price of Ohio crude oil, in conjunction with the railways, we succeeded in getting the price down to an abnormally low figure, and then bought substantially the whole Ohio producing field.

I now present a statement covering the years from 1890 to 1898 showing our relation to the business of producing oil, not only in Ohio, but in Pennsylvania, thinking it would set the matter at rest, as the question has been raised:

Production of Pennsylvania and Lima crude oil by Standard Oil Company and others, years 1890 to 1898, inclusive.

[Expressed in barrels of 42 gallons.]

Year	Pennsylvania Oil			Lima oil			Grand total		
	Total production	Standard Oil Co. production	Standard Oil, per cent of total	Total production	Standard Oil Co. production	Standard Oil, per cent of total	Pennsylvania and Lima production	Standard Oil Co. production	Standard Oil, per cent of total
1890	30,065,867	2,618,637	8.71	15,014,882	8,400,568	55.95	45,080,749	11,019,205	24.44
1891	35,742,127	4,913,775	13.74	17,381,923	9,319,156	53.61	53,124,050	14,232,931	26.79
1892	33,332,306	4,338,822	13.02	16,685,193	7,843,324	47.01	50,017,499	12,182,146	24.36
1893	31,256,283	6,705,276	21.45	17,823,255	7,260,899	40.74	49,079,538	13,966,175	28.46
1894	30,696,716	7,210,345	23.49	18,575,603	6,690,951	36.02	49,272,319	13,901,296	28.21
1895	30,891,868	9,119,920	29.52	21,719,250	6,808,876	31.35	52,611,118	15,928,796	30.28
1896	33,908,041	9,380,654	27.66	25,222,091	8,031,793	31.84	59,130,132	17,412,447	29.45
1897	35,170,367	9,787,353	27.83	22,793,033	7,497,349	32.89	57,963,400	17,284,702	29.82
1898	31,645,151	11,248,443	35.55	20,266,328	7,220,606	35.63	51,911,479	18,469,049	35.58
Total...	292,708,726	65,323,225	22.32	175,481,558	69,073,522	39.36	468,190,284	134,396,747	28.70

This is in answer to Mr. Lockwood's statement, as, I repeat, that we had bought substantially the whole of the Ohio producing field.

Mr. Lockwood's statement, that when the Standard Oil Company buy pipe lines producers have to pay for it two to 40 times over is so ridiculous as not to call for any answer.

In conclusion, gentlemen, it is really difficult to answer seriously a man who indulges in such extravagance of statement as has characterized Mr. Lockwood's testimony. Indeed, it is difficult to believe that he takes himself seriously. We can forgive such a man in whose veins runs the boiled down pugnacity of 147 revolutionary sires, but when he ruthlessly attacks judges and courts and claims that the entire railroad and corporate interests of the country find their chief avocation in the "corrupting of public affairs and the debauching of public men," I think you will agree with me that we must conclude that the "fool killer" has been very remiss in his duty in the vicinity of Zelienople, Pa.

MR. RICE'S CONNECTION WITH CONTEMPT PROCEEDINGS AGAINST THE STANDARD.

In confirmation of the statement which I have made regarding my interrogatories with Mr. Rice and his overtures to me in connection with his business, I desire also to read for the information of the commission a transcript from the testimony of Mr. Rice given on cross examination in the suit of the State of Ohio vs. The Buckeye Pipe Line Company, taken on the 20th of February, 1899:

"First. In relation to Rice's connection with the contempt proceedings against the Standard Oil Company of Ohio.

"Q. Mr. Rice, you know that a proceeding for contempt was instituted by the attorney general of Ohio against the Standard Oil Company? A. Yes, sir.

"Q. Did you employ counsel in that case? A. I did.

"Q. Who? A. W. L. Flagg.

"Q. What other counsel did you employ? A. Mr. Kinkead.

"Q. He is now acting as special counsel for the attorney general? A. Yes, sir.

"Q. How long prior to the commencement of these proceedings in contempt against the Standard Oil Company did you employ Mr. Flagg? A. Two or three weeks—less than a month.

"Q. Did you employ him to assist the attorney general in instituting and conducting the proceed-

ings in contempt? A. I should say that would be most natural.

"Q. Did he come here to Columbus for a consultation with the attorney general? A. Yes, sir.

"Q. Did you come with him? A. I guess I came on before.

"Q. You had your consultation with the attorney general before he came? A. Yes, sir.

"Q. You three had consulted together? A. Yes, sir.

"Q. When did you employ Mr. Kinkead? A. That was about the same time, not just exactly.

"Q. Was he brought into this conference by you. A. Yes, sir.

"Q. At that time he was not employed by the State, A. I do not think he was.

"Q. He was your private counsel? A. Yes, sir.

MR. RICE'S OFFER TO MR. ARCHBOLD.

"Cross examination in relation to Mr. Rice offering to sell his property to Mr. Archbold.

"A. He (Archbold) wanted to know what I I would take to go out of the business, and I told him $250,000 and $50,000 per year for five years; but several years before that he wanted to buy my plant and I offered to sell it for $25,000 and $5,000 for five years, and before that time I offered to sell it for $20,000. I have a perfect right to ask what I please for my plant.

* * * * * * *

"Q. Did you authorize or request Mr. Orvis to have an interview with him (Archbold)? A. No, sir; not at first.

"Q. Did you at any time? A. I may have done so.

"Q. Now, coming to the second interview, did you have another interview in June, 1890, with Mr. Archbold at his office in the Standard Oil building at 26 Broadway, in New York? A. I do not recollect.

"Q. Did you then make a similar offer to him? A. I did not have a second interview with Mr. Archbold.

"Q. Did you at that time authorize Mr. Orvis to make an offer to sell your property for $500,000? A. Yes, I guess I did.

"Q. You were to get $250,000 cash, and $50,000 for five years? A. I guess so.

"Q. What were you to give Mr. Archbold for that consideration? A. I was to sell out my plant and get out of the business.

"Q. Were you to refrain from bringing any further litigation? A. That was to settle up the whole trouble; I was to do nothing further—have no litigation or anything of that kind."

Q. Have you a general statement to make with reference to the organization of the company? A. I have a general statement I would like to make.

Q. (By Mr. Phillips.) Just proceed with your statement. A. I desire to say that this is a much pleasanter task for me than attempting to answer the allegations of the various witnesses. I did not come here, gentlemen, desirous of making this answer ,although I am naturally under some feeling with respect to these charges so often and unfairly reiterated against us—to assail anybody harshly—and if I have been led into any expression that seems harsh at any time during the course of my answers I am sorry for it. It is out of the fullness of what I believe to be the correct answer, and a desire to make it as positive as possible, certainly not with any disrespect to this commission. It is a much pleasanter task for me to undertake, gentlemen, to say a word more particularly in defense of the organization with which I have passed almost my entire business life, intimately related with it, and in which I have the most personal pride. Shall I proceed?

Q. (By Mr. Phillips.) Certainly.

LARGE CORPORATIONS A NECESSARY RESULT OF GROWING COMMERCE.

Trusts, or speaking correctly, large corporations, are the necessary—indeed the irresistible—result of our rapidly growing commerce. In adopting them we are but following the example of that greatest of all commercial nations, England, under whose commercial charters capitalization and scope are practically unlimited. Any legislative restriction imposed here would operate alone to the benefit of foreign commercial competitors. The claim that such restriction would help the weak and incompetent of our own country as against the strong and aggressive is too peruile to call for serious answer. I speak today especially in defense of the aggregation of capital and experience in the petroleum business, on the ground of its absolute necessity, for the successful development and promotion of that business. I am here to defend the Standard Oil Company organization, also on economic and ethical grounds. Not to indulge in undue length, I will lay down a number of leading propositions in support of my position, which may serve as texts for more extended discussion, if you desire.

GOOD RESULTS OF THE RISE OF THE STANDARD.

The early years of the petroleum industry were marked by a chaotic and crude condition in all the branches of the trade, namely, the production, manufacture, transportation and marketing; and the average quality of the refined products was inferior and unsatisfactory. The advent of the Standard Oil Company aggregation changed this entirely. It brought to the business ample capital and combined into effective working shape the best possible talent in all branches of the business. It improved quality and greatly reduced costs. It supplanted old and inferior methods and refineries with the newest and most progressive methods and most perefectly equipped and favorably located refineries. It has been ever on the alert to engage the best obtainable practical and technical talent for the

development and improvement of the business in all its branches. It inaugurated new systems of transportation, which not only gave the producer the most efficient possible service at greatly reduced cost, but a daily continuing cash market for his product on a basis of the best price obtainable in the world's markets. Further, it reached out and occupied the markets of the world for American petroleum. Individual effort could not have accomplished any such herculean task in many times the same period, and indeed, the efforts of the Standard Oil Company were none too quickly made. If there had been as prompt and energetic action on the part of the Russian oil industry as was taken by the Standard Oil Company the Russians would have dominated many of the world's markets which have been made to inure so largely to the benefit of the American oil industry. Later in the history of the trade Russia and other oil producing countries have followed in the footsteps of the Standard Oil Company in the general markets of the world, and I now hand you a statement, partial in character, of the oil companies of Russia, the Dutch East Indies, Galicia, Japan and other countries, which will give you some faint idea of the menace which even now threatens the American oil industry; and when you reflect, gentlemen, that there has been brought to this country during the past 30 years from the exportation of petroleum and its products nearly $1,500,000,000 you will appreciate the importance of this subject.

LIST OF CORPORATIONS AND INDIVIDUAL FIRMS PRODUCING AND REFINING PETROLEUM.

Russia.—Production on the Peninsula Apsheron, on the west shore of the Caspian Sea: Nobel Bros., capital 15,000,000 rubles ($7,500,000), bonds $3,750,000; Russian Petroleum and Liquid Fuel Company, formerly Tagaeffs, capital £1,200,000 ($6,000,000); Anglo-Caucasian Company (Rothschilds); European Petroleum Company; Anglo-Russian Petroleum Company, Limited, capital £120,000 ($600,000); Sheibieff Petroleum Company, capital £750,000 ($3,750,000); Baku-Russian Oil Company, capital £1,500,000 ($7,500,000); Mantashoffs property; capital 26,000,000 rubles ($13,000,000); Societe Caspienne (Rothschilds), capital 6,000,000 rubles ($3,000,000), but money invested much larger; Caspian Oil Producing and Trading Company, capital 2,000,000 rubles ($1,000,000); Mirzoff Brothers Oil Producing Company, capital 2,140,000 rubles ($1,070,000); Ropes Refining Company, capital 1,200,000 rubles ($600,000); Tsoovianoff, Rillsky, Asadoolaieff, Zeitlin & Zirkvich, Caucasian Oil Company, Toomayeff & Co., Kaplan & Lev, Kascheyeff, Lianozeff, Vizierеff, Nagieff Moosa, O. Leites, Kvarenstron, Lootch, Zeinaloff & A. Dembot Bros., Hatzasriantz, Pogosoff, Hagan & Zeitlin, Metrfanoff, Beneinson, Egiazaroff, Nedezda, Shagidanoff, Melikoff, Mananoff, L. M. Leites, Sarkiesoff, Chicnaveroff, Adamoff Bros., Sergaieff Bros., and ten other smaller concerns.

Grosni.—Oil territory in northwest from the Caspian Sea oil territory; Grosni Company, of Akhverdoff, capital 1,500,000 rubles ($750,000); Moscow Oil Producing Company, Grosni, capital 3,000,000 rubles ($1,500,000); Maximof & Co., Petersburg Petroleum Company; Rousanofsky; Belgian Company, at Soupsa, near Batoum, Black Sea, capital, 575,000 rubles ($287,000).

Galicia.—Anglo-Austrian Petroleum Company, Limited, capital £125,000 ($575,000); Mineral Oil Company, Budapest (Rothschilds); Anglo-Galician Oil Company, Limited, capital £560,000 ($2,800,000); Galician Petroleum Company, capital 1,000,000 florins ($400,000); and the following oil territories are offered for sale: T. Laszez at Kobylaoka, 71 acres; Mad Jodwigo Biechomka, 569 acres; G. Kropiwnsk at Schodnica, 250 acres; Veadomir Podhorodzki, 425 acres; Mad Malwine Szezpanska, 57 acres; W. Posteuski at Swoboda, 426 acres; Kosimerz Lipinski, 128 acres, and a great many others.

Roumania.—Roumania Oil Syndicate, capital £500,000 ($2,500,000), bonds $1,000,000; Roumania Oil Trust, capital £710,000 ($3,550,000), bonds $1,250,000; Holland Roumania Petroleum Company, capital 1,000,000 florins ($400,000); Netherlands Roumania Petroleum Company, capital 500,000 florins ($200,000); Amsterdam Roumania Petroleum Company, capital 1,000,000 florins ($400,000); Roumania United Oil Company, Limited, capital £720,000 ($3,600,000), bonds $600,000; Estate Prince Cantacuzino; Estate Harnia, Campine; Estate Prince Montiosa, Buzen, and many concessions for drilling granted to natives and foreigners.

Borneo, Dutch East Indies.—Netherlands, India Industry and Trading Company, capital 2,000,000 florins ($800,000), but $1,750,000 invested; Bolangan Exploring Company, capital 150,000 florins ($60,000); Kotei Exploring Company, capital 300,000 florins ($120,000); Martapoera Mining Company; Tarakan Mining Company, capital 240,000 florins ($96,000); Bombay Burmah Trading Company, British Borneo, capital large.

Sundries in East Indies.—Doda Mining Company, Celebes, capital 125,000 florins ($50,000); Boela Company, Ceram, Molucca Islands.

British India.—Burmah Oil Company, Limited, Rangoon.

Alsace, Germany.—Pechelbronn Oil Works, capital 3,000,000 marks ($750,000); Rudolf Biblishheim Company, capital 1,200,000 florins ($480,000); Gute Hoffnung Company; Alsace Petroleum Company, capital 200,000 florins ($800,000); the Petrolia Company.

Japan.—Mitsumata oil field, Ogidaira oil field, Kitayama oil field, Tatsuno oil field, Yamatera oil field and Amase oil field are worked by Nippon Petroleum Company, capital unknown; Tokyo Petroleum Company, capital unknown; Osaka Petroleum Company, capital unknown; Echiqo Petroleum Company, capital unknown; Oriental Petroleum Company, capital unknown.

Miyagawa oil field, Nagamine oil field, Hirayeama oil field, Nita or Samata oil field, Akata oil field, Miyohoyi oil field, Abuaradan oil field, Jabani

oil field, Ida oil field, Betsuyama oil field, Koshi oil field, Katsubo, Urase, Katsurazwa, Tsubakizawa, Mivjayi, Asoda, Mizuana, subdivisions of Koshi oil fields are partly worked by individuals and the above companies. In addition there are about 20 more oil fields, of which are most prominent as to their production the following: Niitsu oil field, Shiodani oil field, Koguch oil field, Niigata oil field, worked by indivduals and above companies.

Sumatra.—Royal Dutch Company, captal 5,000,000 florins ($2,000,000), bonds $1,200,000; Sumatra Palembang Petroleum Company capital 7,000,000 florins ($2,800,000); Boissevain Syndicate; Moera Enim Petroleum Company, capital 10,000,000 florins ($4,000,000); Netherlands India Exploration Company, capital 300,000 florins ($120,000); Moesi Ilir Syndicate, Sumatra Petroleum Company, Limited, capital 2,400,000 florins ($960,000); Shanghai Langkt. Tobacco Company, $500,000; W. T. Wisse, Deli Company, Banjoe Asin Exploration Company, capital 120,000 florins ($48,000); Nagel Concession, Ali Cohen Bengkoelen concessions, Kessler concessions (about 5,000,000 acres), Petroleum Company Iliran, capital 1,200,000 florins ($480,000); Belang Mining Company, capital 140,000 florins ($56,000) Palemburg Exploration Company, capital 250,000 florins ($100,000); Langsar Petroleum Company (Acheen), capital 800,000 florins ($320,000), and many millions of acres under concession to private parties.

Java and Island of Madoera.—Dordt'sche Petroleum Maatj., capital 15,000,000 florins ($6,000,000); bonds $2,000,000; Rembang Petroleum Company, capital 500,000 florins ($200,000); Japara Petroleum Company, capital 500,000 florins ($200,000); Company Insulinde, capital 3,000,000 florins ($1,200,000); Toan Lok Sourb. Petroleum Company, capital 300,000 florins ($120,000); Eastern Exploration and Exploiting company, Tegal Petroleum Company, capital 500,000 florins ($200,000); Netherlands, The, India Petroleum Company, capital 700,000 florins ($280,000); Java Petroleum Company, capital 1,000,000 florins ($400,000); Batavia Japara Petroleum Exploration Company, capital 200,000 florins ($80,000); East India Exploration Company, capital 300,000 florins ($120,000); Rotterdanische Petroleum Company, capital 1,500,000 florins ($600,000); Gaboes Petroleum Company, capital 600,000 florins ($240,000); Sourbaya Petroleum Company, capital 250,000 florins ($100,000); Central Java Exploration and Exploitation Company, capital 240,000 florins ($96,000); Polynesia Petroleum Company, capital 500,000 florins ($200,000); Bantjar Development Company, capital 500,000 florins ($200,000); Madoera Petroleum Exploitation Company, capital 100,000 florins ($40,000); Archipelago Exploration Company of Amsterdam, and many millions of acres under concession to private parties.

It is true beyond a question that the result to the public of the operations of the Standard Oil Company has been highly beneficial, and not hurtful, as its enemies claim. As has been already stated, it has given the public gooods of vastly improved quality at greatly reduced prices. It has by its effective system of distribution, supplied this most necessary article for domestic consumption promptly and cheaply to the most remote sections of our country, and indeed, to the world. Beyond all this, however, it has given to the community at large an opportunity for investment in the business itself, which it could never have had under the old system. Thus there are today partners in the Standard Oil Company as shareholders to the number of fully 3,500, where less than one-twentieth of that number would have been interested as partners under the old system.

NO TROUBLE WITH LABOR.

It has been most beneficial in its effect on labor. There could be no stronger evidence that the labor involved in its vast operations has been well paid and contented than lies in the statement that for more than a quarter of a century since the Standard Oil Company began its operations, it has scarcely had a serious strike of any kind among any branch of its employes—one or two temporary strikes among some special classes of workmen in sympathy with other labor organizations who were striking constituting the sole disturbances. Indeed, it is not too much to say that to the loyalty and zeal and intelligence of its vast army of about 35,000 employes the company is largely indebted for its strength and efficiency.

I unhesitatingly express the opinion that, when the history of our time is written, it will appear that the marvelous commercial and industrial evolution which we are experiencing in this great country during the year 1899 marks one of the most important steps of progress in our country's history. It will prove to be of immense value to all classes of our population. The investor, the consumer and the laborer will all be benefited by it; the investor by the better security which arises through amplitude of capital for the business contemplated, and the combination of talent in the various departments of administration; the consumer through improved processes resulting in better products at lower prices, and more efficient distribution; the laborer by steadier employment at better wages, and a better opportunity for improvement in condition, if special talent is shown.

The outcry, gentlemen, against corporations does not come from the great, busy, industrial classes, but from impractical sentimentalists, yellow journals, and political demagogues; from the latter, perhaps more than any other. It is a veritable attack upon thrift and prosperity. To listen to their voice to the extent of imposing restrictive legislation would mean a frightful step backward in the commercial development of our country.

NATIONAL CORPORATIONS THE NEXT STEP OF PROGRESS.

If you should ask me, gentlemen, what legislation can be imposed to improve the present condition, I answer that the next great, and to my mind

inevitable step of progress in the direction of our commercial development lies in the direction of national or federal corporations. If such corporations should be made possible, under such fair restrictions and provisions as should rightfully attach to them, any branch of business could be freely entered upon by all comers and the talk of monopoly would be forever done away with. Our present system of State corporations, almost as varied in their provisions as the number of States, is vexatious alike to the business community and to the authorities of the various States. Such Federal action need not take away from these States their right to taxation or police regulation, but would make it possible for business organizations to know the general terms on which they could conduct their business in the country at large. Lack of uniformity in the laws of the various States, as affecting business corporations, is one of the most vexatious features attending the busness life of any great corporation today, and I suggest for your most careful consideration the thought of a Federal corporation law.

Q. (By Mr. Jenks.) Have you any further statement with reference to the organization of the Standard Oil Company itself? A. That will be included in the statement Mr. Dodd will submit; or the data regarding the organization, I think, will be in that.

PETROLEUM CONCERNS IN RUSSIA AND ELSEWHERE.

I want to hand you in connection with this paper this most interesting statement, whch I think perhaps, is the first general compilation of the information that has ever been made in the country here; almost a surprise to us, who are daily familiar with the oil business, as showing a tremendous growth of the foreign petroleum business. I will only refer by name to the countries in which petroleum is now successfully mined and prepared for market. Capitalization, so far as we are able to obtain it, and the names of the companies which, as I think are substantially accurate appear in this statement.

Q. (By Mr Smyth.) Could you give us anything like the proportion? A. I have the statement which, I think, shows the proportion of business done. It will be a little surprise to you to see the enormous capitalization of the business attaching to the Russian development, and I may say in a word of oral explanation that the business there is getting to be in strong hands. When I mention the name of the Rothschilds, that will be sufficient guaranty as to the strength of the company; and they are now growing enormously in the extension of their business in the various markets of the world.

The Nobel Brothers are there competing for the business with tremendous energy. Recently, perhaps within the past year, more than in the aggregate time before, English capital and English corporate organizations have engaged in the petroleum trade in Russia to an enormous extent; the largest concern perhaps being the Shell Company, Sir Samuel Samuels, late lord mayor of London. I hand you this list showing firms in Russia, and this showing list of corporations in Galicia, a further statement form Roumania, one from Borneo, and sundry places in the Dutch East Indies, in British India, in Japan and in Alsace, Germany. It will probably be an item of information to many of you that the production of petroleum is assuming great proportions in Japan. They are now very rapidly progressing, are coming to the front in improved methods of production, and will ultimately become a formidable competitor to our American industry. The system of petroleum refining in Japan is by corporations and individual firms going out into the different fields and producing and refining. In Sumatra the business has already attained large proportions, and in Java and the island of Madeira.

Q. (By Mr. Smyth.) Is there any American capital represented in these firms? A. There is no American capital that I know of. But they have sent out and taken from our oil producing country here many artisans.

Q. (By Mr. A. L. Harris.) Then the Standard Oil Company is not represented in any of those corporations? A. Not in any way.

Q. Not even in the Nobel Brothers? A. Not a dollar of interest in any way, or relationship or understanding.

Q. (By Mr. Smyth.) I suppose English capital being interested in Russian refining is one of the causes of attack on the American oil in London? A. Undoubtedly, but as I said this morning, I think the attack was undoubtedly made by the people directly and largely interested now in the Russian distributions in the different countries. It may be of interest to read a short letter from our foreign exporters:

New York, September 1, 1899.

J. D. Archbold, Esq., Building.

Dear Sir: I beg to hand you herewith the statements you desired, in duplicate, and wish to say that the Russian production is on the peninsula of Apsheron, on the west coast of the Caspian Sea, and the Grosni district, northwest from the same.

We estimate the Russian production at present to be about 160,000 barrels per day, and Grosni at about 10,000 barrels daily. The Galiuian production is about 2,000,000 barrels crude, and Roumania 500,000 to 600,00 barrels per annum, and the Alsace production about 175,000 barrels crude annually. The Dutch East Indies about 3,400,000 barrels, Burmah about 2,000,000 cases refined per annum, and Japan will probably amount to about 2,000 barrels crude oil per day.

Of course, we give you these figures as near as we can get them, and where we give you the output of refined we have no reliable figures as to what it may represent in crude.

Yours truly, C. F. Ackermann.

I have here another statement. This covers the information which you ask as to the percentages of

these various countries. It is for the year 1897. Unfortunately we have not the full data at hand with which to give you the 1898 figures. This statement shows the business of all countries of the world producing refined oil. Some little percentage of it, as you will observe, is not the production of our country, but is shown in this way because the country named compels, by its tariff laws, the bringing into that country of the crude petroleum for refining there, but the larger items are the production of this country as you will observe.

The total production in the world of refined petroleum illuminating oil, for the year 1897, was 39,338,991 barrels of 50 gallons each and was divided as follows. I will give the percentage if you please.

Q. (By Mr. Jenks.) Yes. A. United States, 64.23; Russia, 23.28; France, 3.25; Austria-Hungary, 2.66; Sumatra, 2.32; and the remainder, Scotland, Canada, Java, Roumania, India, Spain, Mexico, Cuba, Brazil, Germany, Peru, Italy, Japan, and Porto Rico are all fractions of less than one per cent, making the grand aggregate of 100 per cent; the great factors, as you will see, for the year, being the United States and Russia; and a rapidly increasing factor, of course, in Austria-Hungary and Sumatra.

World's production of refined illuminating oil, 1897.

Product of	Barrels of 50 gallons	Per cent of total
United States	25,268,628	64.23
Russia	9,160,700	23.28
France	1,277,761	3.25
Austria-Hungary	1,046,359	2.66
Sumatra	914,000	2.32
Scotland	331,857	.84
Canada	251,843	.64
Java	230,392	.59
Roumania	230,000	.59
India	180,685	.46
Spain	157,684	.40
Mexico	104,287	.27
Cuba	58,413	.15
Brazil	35,306	.09
Germany	34,822	.09
Peru	19,193	.05
Italy	15,136	.04
Japan	13,689	.03
Porto Rico	8,236	.02
Total	39,338,991	100.00

The population of the world is 1,349,140,091; the production of illuminating oil is therefore equal to 1.5 gallons per capita.

Q. (By Mr. Clarke.) Do you suppose there has been an increase since these statistics were given? A. The business of Russia is increasing rapidly. Here is a further statment of crude oil, the world's production, which may be of interest in looking over in a general way.

World's production of crude petroleum, 1897.

[Barrels 42 gallons.]

Country	Barrels	Per cent of total
United States	60,496,499	47.96
Russia	57,094,303	45.26
Austria-Hungary	2,087,617	1.66
Sumatra	1,777,560	1.41
Scotland (1896)	1,316,894	1.04
Canada	809,199	.64
Java	726,373	.58
Roumania	570,886	.45
India (1896)	430,203	.34
Japan	283,571	.23
Germany	165,822	.13
France	70,000	.06
Peru	68,452	.05
Argentine	21,000	.02
Italy	18,149	.01
Other countries (estimated)	200,000	.16
Total	126,136,528	100.00
Total production 1896	118,298,631	.....
Increase	7,837,897	6.6

Crude oil production by States, years 1896, 1897.

[Barrels of 42 gallons.]

States	1896	1897	Increase or decrease	Increase or decrease	Average value per barrel	
					1896	1897
Pennsylvania	19,795,779	18,439,180	1,356,599	6.9	$1.186	$0.795
New York	736,606	771,606	35,000	4.8	1.179	.786
West Virginia	10,005,966	13,078,011	3,072,045	30.7	1.180	.788
Ohio (Pennsylvania oil)	3,365,365	2,877,193	488,172	14.5	1.180	.788
Ohio (Lima oil)	20,575,139	18,682,677	1,892,462	9.2	.739	.520
Indiana	4,646,952	4,110,356	536,596	11.5	.630	.456
Kentucky	1,680	322	1,358	80.8	.550	.500
Tennessee	4,325	4,377	52	1.2	.....	.....
Missouri	43	19	24	55.8	4.30	9.16
Colorado	361,450	477,499	116,049	32.1	.883	8.10
California	1,252,777	1,903,411	650,634	51.9	.990	.900
Kansas	113,571	81,098	32,473	28.6	.450	.400
Wyoming	2,878	3,650	772	30.3	8.00	8.00
Illinois	250	500	250	100	5.00	4.00
Texas	1,450	65,975	64,525	.....	.720	.570
Indian Territory	170	625	455	.....	4.000	3.30
Total	60,864,401	60,496,499	367,902	0.6	.960	.676

Total value of production, 1896.....$58,518,709
Total value of production, 1897..... 40,929,611

Decrease.....$17,589,098

Total production in the United States, 1859 to 1897, inclusive (38 years) 837,494,059 barrels, on the basis of 5.6 cubic feet to one barrel of oil. This amount of crude oil would fill a pipe line 6.9 feet in diameter, extending entirely around the earth. It would cover a surface of 10,000 square miles to a depth of 0.2 inches, or fill a reservoir having an area of one square mile and a depth of 167 feet.

PETROLEUM EXPORTS FROM THE UNITED STATES, 1861 TO 1898.

Q. (By Mr. Farquhar.) Have you furnished the commission today with the total exports of the Standard Oil Company, from the first, all over the world out of the United States? A. I do not think I have submitted any statement. It may be among these statistical reports given that there are such statistics, but I hardly think so. I have for periods given the exports.

Q. (By Mr. Jenks.) Can you furnish the exports year by year? A. From the day we began.

VALUE OF EXPORTS.

Value of exports.

Total value of petroleum products exported from United States for the years 1861 to 1871, inclusive, amounted to.....$ 199,030,333
Value of exports from 1872 to 1898, inclusive (i. e., since the organization of the Standard Oil Company)..... 1,246,846,381
Value of exports by Standard Oil Company.... 1,126,401,021
Standard Oil Company 90.34 per cent total.

PRICES UNDER COMPETITION—WOULD NOT ADVISE GOING BELOW COST.

Q. With reference to the effect of the Standard Oil Company on prices, you have made the general assertion that through the influence of the Standard Oil Company, in your judgment, prices of refined oil have been very greatly lessened to the consumer. Is it generally true that the prices at the present time are cosiderably lower at competitive points than at those where you have little competition? A. Well, I can not speak with any precision regarding that matter. I have no manner of doubt that, when we are closely pressed with competition at any point, we try to hold our trade. That is a natural law of trade, to which we are, of course, subject.

Q. And your general practice is, if a competitor comes into the market? A. I think, as a rule the history of our transactions would be that the competitor forces the fight.

Q. About what proportion of the refined oil of the country do you supply? A. Well, the grand aggregate is there.

Q. Can you state generally? A. I should say that of this country it would be, approximately, the same as the whole; that is, about 82; 80 to 82 per cent.

Q. Do you think that an organization that controls 80 per cent of the goods that go into the market will, generally speaking, have the power, within moderate limits, of course, to fix the prices and force their competitors to follow? A. It might temporarily have such power. If it exercises it unjustly or arbitrarily it would surely lead to its own downfall.

Q. That is, if it attempted to push the prices too high it would call in competition? A. It would invite competition.

Q. And if there is fierce competition between large institutions, prices cut in any locality—prices will go down how low; to the lowest rates? A. Personally, I would never advise selling goods at a loss. I expect it is done in some cases. I would not personally advise selling goods at a loss. I think when you get to cost you are low enough.

Q. You would say, then, as regards your own methods of competition, that where the fighting is forced by competitors you do not cut prices below your cost? A. I hope not when they get to that point, because I would rather keep my works going and labor employed there than to shut down, even at the cost point.

Q. You would not, temporarily, in a special locality, go below the cost point for the sake of freezing out a similar rival, with the expectation of keeping or getting control of your market? A. I do not believe I would. There might be a greatly aggravated case where such a thing would seem advisable, but it would be a rare one.

Q. You would not say that your company had never done that? A. I would not say that it has never done it at all—no.

Q. So far as an organization of the size of the Standard Oil Company is concerned, if you put prices down to cost you can afford to hold them there, of course, very much longer than a similar rival could? A. I think so.

Q. And I presume you are in the habit of doing that to get rid of a competitor at times? A. We are in the habit of fighting vigorously to hold our trade and advance it.

Q. To the extent of holding prices down to cost until the rivals give way? A. Yes.

HOPES THE STANDARD GETS PRICES SLIGHTLY ABOVE COMPETITIVE PRICES.

Q. Now, the general result then is this: By virtue of your greater power you are enabled to secure prices that on the whole could be considered steadily somewhat above competitive prices? A. Well, I hope so. I think we have better merchandizing facilities, better marketing facilities, better distributing facilities, and better talent than a competitor can have.

Q. I am not asking with reference to your power of making profits, but it is with reference to getting the prices from the consumer. A. Prices are what make the profit. If we had a better average price, we could get a better profit.

Q. You think, generally speaking, that you get prices for oil slightly above competitive prices? A. Well, I should think so; I could not answer—that is a very general question and very difficult to answer. I could not answer that specifically. I hope that we do.

Q. Of course, in this investigation we are seeing if we can get some general principles on which legislation might be based, and these questions are to bring out, if we can, the power that so great an organization has in fixing prices. Would you say, then, that in the case of an organization that controls perhaps 80 per cent of the markets of the country, there is a monopolistic element that enters in which enables them to hold prices above the regular rate? Is there a monopolistic power that comes merely from the power of the capital itself? A. Undoubtedly, there is an ability, and when that ability, as I have said, is unwisely used, it is sure to bring its own defeat.

Q. If that ability goes to get an exorbitant price, of course it will invite competition, but when that ability is kept within modest limits, would you still say that it was in the power of such an organization to get the benefit of the monopolistic power that comes merely from the power of capital itself? A. Well, I should say that that would be a very restricted power, a very restricted limit. The competitors in this country are very active.

Q. What? A. The competitors are very active; they are alert at all points with their small offerings in the hope to find just such a condition as you describe.

Q. Certainly. A. But, as I say, as business is and as it has been for many years, we could not have that ability to any considerable extent as merchants.

Q. If the ability were operative only to a slight extent, would it still be enough, do you think, to make a difference between what we may call a moderate dividend, say 6 or 7 per cent, and a pretty high dividend of between 15 and 20 per cent? A. Well, that involves so nice a question that I could hardly undertake to answer it; but generally, as to the effect on the community, I should say——

Q. Generally on the prices of the United States? A. I should say that the lessened cost incident to doing business in a large volume more than compensates the consumer for any ability in getting higher prices.

Q. Then that leads to this point, whether the large capital does itself give an organization the power to get a somewhat higher price than it could in the market provided the competitors were substantially equal in power? A. Oh, it may be so; but that is a difficult question to answer.

BY-PRODUCTS.

Q. In your business has there been any decided increase within the last 10 or 15 years in the by-products that come from the refining of oil? A. Oh, my, yes; oh, yes. Their utilization has been greatly improved, and the use of the by-products throughout the world have been enormously increased.

Q. Will you give us a few specific illustrations from your own business? A. Our leading by-products are the light gasoline and naphtha products, the paraffin product that is used in candle making aid kindred uses; lubricating oils for all classes of machinery, as taking the place of the

animal and vegetable oils; the vaseline products, and numberless small products that I do not at the moment, perhaps, recall. I have named the leading ones.

Q. Can you say whether it would be possible for these various by-products to be secured to as great an advantage by an organization that had in its control, we will say, only half a million dollars? A. I don't think it possible for them. I don't think they could undertake the different branches of the business involved in the producing of these various articles to which I have referred with anything like the advantage we have in a large specialization.

Q. That is what you would put down as one prominent advantage that is secured by this large aggregation of capital—the use of the by-products? A. I do; the use of the by-products. It may be rather surprising to know that the by-products of petroleum now equal substantially in value the illuminating oil itself.

OIL SOLD BELOW COST IN THE FAR EAST—BUT FOR THE BY-PRODUCTS.

Q. If so large an income is secured at the present time from the by-products, would it be possible for you still to make profits, even though the main product of the refined petroleum were sold substantially at cost? A. Well, we may possibly, yes, secure a profit. It may be. However, we count the profit from the by-products as part of the whole profits in the management of our business; we take it as a whole.

Q. (By Mr. Smyth.) Which is the larger profit, from the by-products or from the oil? A. Well, I should say—I do not know which is the larger—from the by-products. In estimating the outcome from a barrel of crude, we consider the whole proposition as to what we get from the by-products and the ruling prices for the illuminating oil, and base our prices as a whole on that. Of course, it is to our interest somewhat, or in special cases, if not to our interest, these gentlemen who are our competitors in the near-by market and do not have to face the problem that we do, more particularly in competition with Russia and in the markets we have reached in the far east, will force us to do the best we can. We have been basing our calculation on the expected output; made the prices for refined oil in competition with them there, which would have given no margin of profit whatever to us here. We have had to do that so far as to hold those markets for the general American trade as against the Russian aggression.

Q. If I understand you, you say you did that in the eastern markets you have done it? A. On a very low basis; I should say at below cost, figuring transportation and the ordinary charges.

Q. And secured your profits from the by-products? A. Yes; been satisfied with that.

GENERAL IMPRESSION THAT THE MARGIN HAS NOT INCREASED IN SIX YEARS.

Q. As regards the home market here, the statement was made by you that the price has been steadily lower. If we take the margin between crude petroleum and the refined petroleum, we find that for a number of years past this margin does not seem to have lessened very materially in spite of the increased profit that has come from the by-products? A. There is a basis below which it is not possible to go very much.

Q. How far? A. I think the experience of our competitors is perhaps the best proof of the fact that with reference to the business as a whole it is pretty close. It has been carried on a pretty fairly close basis.

Q. Would you say that the margin of profit now in the refining industry was no greater, if we take the period of, say, the last three years, than it was eight or ten years ago? A. Well, I could not speak from memory as to eight or ten years ago.

Q. About six years ago, your general impression is—— A. That it is not. My general impression is that it is not. I speak of all these matters with some little reservation, from memory. I am just as accurate as I can be from memory. I should not like to be incorrect.

Q. On account of the many assertions which have been made on all sides on this question, I should like to get as close as possible. A. I will answer you just as well as I can. If I err, I will endeavor to err on the safe side.

BUYING CRUDE IN PENNSYLVANIA—REFINED CHEAPER THAN CRUDE.

Q. The general question has been asked as to the general effect of the Standard Oil Company upon the price that is paid the producer for crude oil. Do you know about what proportion of the Pennsylvania product you purchase? A. Well, I think the percentage of the business done by us as a whole would be perhaps the best illustration of that.

Q. Can you recall, offhand, the figures? A. Perhaps our percentage of the Pennsylvania would be less than 82 per cent, because a larger proportion of the competitive business is done in Pennsylvania than in Ohio. I should say in the neighborhood of 80 per cent.

Q. Your purchases in this Pennsylvania field are made through your pipe line. Have you a general purchasing agent? A. Not through the pipe line.

Q. It is through your general purchasing agent? A. Mr. Joseph Seep, of Oil City.

Q. The prices that Mr. Seep there gives are fixed by you? A. Well, they are suggested, as a rule, by us.

Q. He is your general purchasing agent, and there are various sub-agents there? A. Yes.

Q. Do you recollect about how many? A. I should say forty or fifty.

Q. The prices are fixed for it generally, as you say, from your office. As covering the principles on which these prices are fixed, a circular Mr. Seep issued some time ago was produced here, stating that the prices that he would pay would be fixed, in general, by the world's markets. The implication would be that the prices would not vary probably very frequently or very violently. Has it been true, generally, that prices have kept stable for the crude oil of Pennsylvania? A. Well, the prices have varied somewhat during the past several years, according as the outlook was for the production, and as the demand was. It could not be better stated by me than the circular states it. We have before us daily the best information obtainable from all the world's markets, as to what the offerings are, and as to what it is possible to sell for; and we make from that the very best possible consensus of prices, and that is our basis for arriving at the current price.

Q. Generally speaking, are the relative prices of crude oil and the refined oil kept substantially uniform? A. We know all about it every day, of course.

Q. And is the relation kept substantially uniform? A. Oh, substantially so. Of course, it is not always the same. Of course, it seems possible sometimes to get a higher price, and we are glad to avail ourselves of the opportunity; and sometimes we have to take a closer margin and still buy the crude, and there, of course, we suffer a loss.

Q. Statements have been made here by some of the witnesses to the effect that there have been times when refined oil at the seaboard was selling lower than crude. A. I should say that is a very exceptional case. I do not recall.

Q. Can you suggest any circumstances where that would be the condition of affairs? A. I do not recall any such period. The answer is already given by me that, in competing with the Russians at certain times for certain markets, we have made prices for refined that were as low as the crude products and have taken our returns on the profits from the by-products; but they have been very exceptional cases, and it is not the case today; it does not at all exist today.

REASONS FOR DISMANTLING REFINERIFS.

Q. You have at times purchased the plants of your competitors and dismantled them? Instances of that kind have occurred? A. Oh, my, yes.

Q. Will you state the business conditions which, in your judgment, justified that? A. I endeavored to do that as directly as possible in my general argument.

Q. Will you sum it up again? A. It is this, that we have at times bought refineries with the expectation of succeeding to the volume of business done by them. We have universally replaced the capacity of these refineries by better ones and better equipped construction at more favorable points. We would not buy refineries and dismantle them for the pleasure of doing it. We have done it because of a carefully considered business proposition, that being in the direction of economy in the business.

Q. I will call your attention to the case of some refineries that were bought up at Titusville. Perhaps you can explain somewhat in detail those cases. A. They were no exception to the rule. We had opportunities to utilize some of that property quite advantageously as small refineries. I think one of them was taken to Porto Rico. One was taken to Kansas, where it was put in after the new production; and one to Porto Rico, where we were compelled by the tariff laws to refine.

Q. (By Mr. Smyth.) Is the production equal to the demand? A. Oh, always vastly in excess of it; vastly in excess of it.

Q. (By Mr. Jenks.) You made the statement that the dismantling of the plants at different times had not lessened your output. A. Oh, no. Of course there has been at all times an excess of capacity as compared with the demand. The capacity of the refineries is never run full—on very rare occasions—I should say, never. And the sole purpose in the abandoning of any plant would be to conduct the business at a point where it might be more economically done.

Q. Incidentally, in connection with that, it might be a more convenient way of holding your market in the locality where competition would figure. A. Precisely.

Q. That would enter as one factor? A. That would enter as one factor; yes.

NOT THE STANDARD'S POLICY TO MAKE PRICES SPECIALLY HIGH AFTER THEY HAVE BEEN CUT SPECIALLY LOW.

Q. The assertion is frequently made—I do not recollect whether it has been made on the stand—that in certain localities where you are compelled, in order to keep the control of your trade, to put prices down for a time until a rival withdraws from business, prices are afterwards put up above what they were before in order to recoup the losses incurred? A. There is no such policy in that business.

Q. You have no such policy? A. We have no such policy. It is possible that, in the zeal and anxiety to serve of some overzealous servant, such a case might occur. If so, and if it was known, it would not be approved.

Q. That is not your policy? A. No; that is not our policy. We fully realize that if we survive with our business we must treat the public very fairly.

THE STANDARD DOES 75 PER CENT OF THE CANADIAN REFINING—NO RAILROAD DISCRIMINATIONS IN CANADA.

Q. Statements have been made several times of late in the papers with reference to special dis-

criminations in freight rates that have been secured by the Standard Oil Company in Canada. It is said that they affect very unfavorably other American refineries. A. I am not familiar with it all. I know there have been such agitations in the newspapers, but I have considered it as one of the usual class of such agitations. I will gladly inquire about it. I do not know of any discriminations in our favor; that is, any rates to the exclusion of other shippers of like character at all. Mr. Rogers says Mr. Harris asked a question in that direction, as to our being interested in the refining business in Canada. I did not hear him.

Q. Will yon please tell us about your interest in the Canadian business- A. We are interested in the Canadian refining business and are doing our best in the business there to get it on a fairly profitable basis. It has been very much disorganized there for some time, and we have come into relationship there with that in the past year or so.

Q. How large a proportion of the Canadian refining interest do you control? A. I think about 75 per cent; about 75 per cent.

Q. Have you of late, to your knowledge, made any contracts with the Canadian Pacific and the Grand Trunk with reference to advancing rates from Buffalo and Toledo? A. Well, sir, I have not any personal specific knowledge about the matter; I will gladly inquire about that.

Q. Will you look it up and send us a reply? A. I will.

Q. You will get full information on that subject? A. I will. The advance in rates on American oil from Buffalo and Detroit was made by the Canadian roads in their own interests and is in no way discriminatory in favor of the Standard Oil Company, but rather to the contrary, for that company pays these advanced rates in full and ships over 75 per cent of the American oil consumed in Canada.

DOES NOT KNOW OF ANY RECENT CHANGES IN FREIGHT RATES.

Q. Aside from the question of special rates or special favors by the railroads, the statement has been made that at times you have been enabled to influence the railroads to put rates over certain lines so high that it would work to the disadvantage of competitors who had to use those lines more than you did. For example, Mr. Westgate testified that in shipping oil into Canada he had found himself at a disadvantage on account of this increase in rate of which I have spoken and of which you say you have no knowledge, and that in attempting to ship to Canada by another route, through the State of New York, he found that rates from his refinery to the northern part of New York were very much above the rates that might be considered normal there, judging by the rates on other goods. For example, he found that on other goods the general freight rates to those places in northern New York were Boston rates; but on oil they were special rates. He felt that he was put at a disadvantage on account of the location of his refinery. and that the Standard Oil Company had succeeded in influencing the railroads there to make those special rates to the disadvantage of their competitors. What would you say on that general question? A. I do not know.

Q. The matter would be entirely within the law, of course? A. I don't know of any such condition at all. I have no knowledge of the rates—the tariff rates on petroleum—having been changed in New York State or any place else for a long period. I don't know that to be so. It is within the bounds of possibility, but I should be disposed to doubt it exceedingly.

Q. You would be likely to know in detail with reference to the arrangement of freight rates? A. In New York State?

Q. In New York State and Rhode Island. A. I think I would. I can make inquiry about it. I would say, with reference to the question of coming into relationship with the Canadian refining interest, the question of rates was considered in connection with the refining, but, as I say, I don't know of any rates that are not open to all comers.

Q. That is not the question. Competitors say that rates over one line have worked to their peculiar disadvantage and not to yours? A. I don't know of any such condition. I would say that it would be to the interest of the Canadian roads naturally to encourage business in their own territory. I don't know about that at all as to any preferential condition with us.

REPORTS ON COMPETITORS' BUSINESS NOT SECURED BY IMPROPER OR QUESTIONABLE METHODS.

Q. In the testimony of Senator Davis a statement of this kind was made: That a man in his employ had been approached by a Standard Oil official and offered pay regularly if he would inform the Standard Oil Company with reference to their shipments. Does the Company under any circumstances get information from the employes or officials of their competitors? A. The company does nothing of the kind. If any such case occurred—and it might as an exceptionally rare case on the part of an overzealous employe, who, in his anxiety to know about his competition, might do a foolish thing—it is not approved by the company. When Mr. Davis or Mr. Westgate or anybody else says that we in New York get down to our offices to get our reports early in the morning from the spies we have out, it is utterly untrue. We do nothing of the kind. We are not figuring on Mr. Westgate's or Mr. Davis's business; we are figuring on our own business.

Q. Do you make the general statement that no reports are secured from your agents with reference to the busines of competitors? A. I don't say that. I should say there would naturally be reports, such reports as they could rightfully secure; but that they should secure them by improper or questionable methods of any kind would not be approved by any member of the Standard Oil Company; and

would be only too thankful to have any such case brought to our attention.

STANDARD OIL TRUST DISSOLVED, BUT THE AGGREGATION HAS WORKED AS HARMONIOUSLY AS BEFORE.

Q. You have said that the general information with reference to the organization of the company would be furnished in the answer to the schedules of inquiries that were given you. But there are some matters that would not be covered in that, particularly. From Attorney-General Monnett's testimony, the different forms of organization of the Standard Oil Company are brought out somewhat. You had earlier the trust organization; afterward the trust was dissolved, I believe, and you had a form of organization. Will you sketch briefly the changes in organization that the Standard Oil Company has gone through since the disolution of the trusts? A. Would it not be vastly preferrable to have that in succinct shape as Mr. Dodd would furnish it?

Q. That is not covered directly in the schedule? A. I think it would be so much more intelligently stated from the records than I could give it from memory in an oral statement, and I would like very much if you would await that.

Q. I think it possible that some of the commissioners would like to base some questions on your statement, and then we shall have that for record from Mr. Dodd. A. Well, briefly stated, the Standard Oil Trust, as such, existed from the year 1882 to 1892; formed in 1882 and dissolved in 1892. In 1892, at the time of the dissolution, the majority of the stocks of the various companies concerned or involved in the Standard Oil Trust were distributed to the equitable owners, and that distribution has gone on steadily until this time in the hands of liquidating trustees.

Q. Nevertheless, since that time the different Standard Oil companies have worked together in harmony, have they not? A. The ownership has naturally brought them into harmony of action; the like ownership, of course.

Q. The general way in which the control has been kept uniform has been this, that the men who were former trustees have held the majority of stock in each of these different companies? A. Exactly so.

Q. So that the Standard Oil combination, as we may say, has worked together as harmoniously since the disolution of the trust as before? A. It is hardly fair to call it a combination, but you might call it an aggregation.

Q. An aggregation? A. An aggregation.

Q. But as a matter of fact it has worked as harmoniously as before? A. Yes.

THE AMOUNT OF TRUST CERTIFICATES OUTSTANDING IS SMALL.

Q. Will you explain also briefly—because that was dwelt on also at length by Attorney-General Monnett—the method of distributing the profits to the stockholders under the trust and since? A. Under the trust the profits, of course, were centralized into the hands of the trustees and distributed ratably.

Q. Distributed to the certificate holders? A. Since then the dividends have gone directly to the owners of the shares of the various companies. They have kept the same in one case as in the other, of course.

Q. (By Mr. Phillips.) Have they been paid on the original Standard Trust certificates? A. To the extent that those remained out, they have.

Q. Is there a very large per cent of them remaining out? A. Not very large.

Q. (By Mr. Jenks.) Do you recollect what per cent? A. I could not state; it is becoming very small.

Q. (By Mr. Phillips.) The market quotations are based on the original trust certificates? A. I supposed the quotations were based in New York on stock.

Q. (By Mr. Jenks.) Will you repeat your answer? A. Well, it covers some equitable ownership, as it was.

Q. (By Mr. Phillips.) It is largely distributed now? A. Largely distributed now.

Q. On the original trust certificates? A. No; oh, no; not largely, but to a very small extent only.

Q. And was for quite a time after the dissolution? A. Yes; but it is very rapidly being extinguished.

Q. When the Standard is quoted in the neighborhood of $500,000,000, or $490 a share, do we understand that to be the quotation on the original Standard? A. On what was represented by the original Standard.

Q. On what was represented by the original Standard? A. By the original Standard Trust.

TRUST CERTIFICATES EXCHANGEABLE FOR STOCK OF THE NEW JERSEY CORPORATION REPRESENTING SUBSTANTIALLY THE SAME INTERESTS.

Q. When a purchaser buys on the market 100 shares or 50 shares of what is nominally the Standard Trust certificates and takes it to the company to transfer, what do you give in the place of that? If I should buy 100 shares of Standard Trust certificates and take it to you—— A. You would be entitled to receive a share or an equitable interest in the various companies composing the Trust.

Q. What form is that now in when it is transferred? A. It may, if it is so desired, be in the form of a certificate of stock in the various companies.

Q. They take it that way when they purchase, transfer, or sell? A. They do.

Q. Do they take it in a divided form, or do they give them a certificate representative of these aggregations? A. What is the question? What he would be entitled to? What he would be entitled to would be his interest in the business of the various constituent companies.

Q. Yes; and what form of paper do you give for

that in the way of a certificate? If I buy 100 shares on the market at, say, 490 or 480 or 500, and take that for transfer, or if a man dies and it is sold and transferred to some other person, what kind of a certificate do you give that person; will it represent all these aggregations? A. We give him, if he so desire—we could not at all reissue a certificate of the Standard Oil Trust; we won't issue any new certificate of the Standard Oil Trust, that being in final liquidation—we would give him his stock in the various companies, or, as some of us are now doing, holding our stock through the New Jersey corporation, he would hold his interest in that way. We would give him a certificate in that representing substantially the same interests.

Q. Have you such transfers being made?

Q. (By Mr. Smyth.) Have you got yours in the new stock? A. Oh, to a small extent.

Q. (By Mr. Farquhar.) The question is whether the general Standard Oil cerificate of stock is on the Stock Exchange of New York? A. None on the Stock Exchange.

Q. Not at all? A. No.

Q. Then you take up the eight subdivisions? A. How many—seven or eight?

Q. And the New Jersey company? A. And the New Jersey company.

Q. And the stock that is so quoted in the New York market is what? A. It is the remaining fraction of the Standard Trust.

Q. Of the old trust? A. Yes. Although I think, to a very limited extent, the stock of the New Jersey corporation, which substantially represents all, would be also quoted.

The managers of the Standard have not speculated in its stock.

Q. (By Mr. Farquhar.) The stock that is seen quoted in the New York market is what we might call little driblets of stock? A. That is it.

Q. Ends of estates and stock that has come from the division of property into their hands; in other words, the Standard stock is not in the market, in the general sense of the term, as a dealing stock? A. No, sir; the listing of it on the Stock Exchange is carefully avoided, and they have never endeavored to make it a speculative affair at all.

Q. Have you never, of your knowledge, at any time, known when your stockholders and your directors or officers or others have dealt in those stocks? A. Oh, I think to a limited extent there have been some transactions on the part of the officers in the stock, usually in the way of adding to their interest, perhaps, as opportunity has occurred. I think I have myself. I must myself plead guilty to the charge of having bought 100 shares and then resold them again within the past 10 years. I think that represents my entire stock transactions in 10 years.

Q. Are not usually the stock transactions confined to the officers and the present shareholders of the Standard properties? A. There are a large number of shareholders—3,500.

Q. These are simply figures. It is the main fact that we want. The stock of the Standard Oil, the great properties, is not stock that is usually put into the New York market or any other market, but is property that is confined within a circumscribed number—say, 40 or 50 people—who are the main great owners and managers? A. Undoubtedly, the majority is held within as limited a number as that.

Q. Have you at any time in the history of your company ever sought to make a profit through your stock? A. Oh, dear; no, sir.

Q. At any time? A. Only in the promotion of the business, in the improvement of the stock as a whole, but not as a speculative thing in the stock itself. As I say, I have within the past 10 years personally bought and sold 100 shares. That shows the extent of my operations.

Q. (By Mr. Jenks.) Will a list of the dividends that have been declared on the stock, the value of it, and so on, be furnished in answers to the schedule? A. Undoubtedly.

Q. Those answers have been made? A. So far as I know; Mr. Dodd has the matter in charge, if that was called for.

THE STANDARD OIL COMPANY OF NEW JERSEY.

Q. Now, will you take a moment to explain the organization of this New Jersey corporation out of the others? A. It is simply a New Jersey corporation, with a capital of $100,000,000 of common stock and $10,000,000 of preferred stock, is formed that shall be competent to own stocks of these different corporations, to buy from all parties who own stock as they may desire to sell.

Q. It is expected that these other corporations will practically throw their stock into that? A. Not the corporations; the individuals owning the stock.

Q. (By Mr. Phillips.) Then would it not be a case of a hundred million company absorbing a five-hundred million stock? What would they give them in value for it? A. It is substantially the same value that was represented in this Standard Trust ownership; substantially the same value, whether it is one hundred, two hundred, three hundred, or four hundred.

Q. This new stock would be put out at three or four hundred per cent premium? A. No; there is no new stock being put out.

Q. (By Mr. Smyth.) The capital is to be one hundred millions? A. That is it.

Q. And it is simply a reissue under the New Jersey charter? A. It has nothing to do with the issue; there is no new capital sold at all.

Q. Simply a reissuing of the present stock to the present stockholders under another name and another charter?

Q. (By Mr. Phillips.) Necessarily carrying the same value? A. In other words, the trust being dissolved and the parties in it receiving their equitable shares in the various companies, bring them

and sell them to the Standard Oil Company, of New Jersey.

PREMIUMS ON CRUDE OIL MEAN USUAL QUALITY; SOMETIMES COMPETITION.

Q. (By Mr. Jenks.) Will you explain to us briefly the system of premiums on crude oil in the districts where the crude oil is purchased? A. In the producing districts?

Q. In the producing districts. A. The premiums are usually the result of the question of value in the different parts of the district. I will not say that in some cases they have not been lower somewhat, caused by competition; where we have had private facilities in certain districts to take care of the oil, and other people had come in and tried to take it away from us, in some cases we may have paid more than we would like to pay. I can not say; perhaps that is so; but, as a rule, in the special case of the Franklin oil and the case of the Lima oil and Scio oil, that is not it. It centers entirely on the question of value.

Q. I infer from what you say that at times, in order to dispose of competitors, the premiums have been kept on till the competitors have been bought out and have been dropped afterwards? A. As I said, when our business has been attacked we have endeavored to protect it.

Q. (By Mr. Phillips.) I am somewhat familiar with the pipe line business in the oil fields. Take our district, where an independent line went in a short distance from Oil City; a premium was put on that oil, and no one claimed that that oil was more valuable than Oil Creek oil or any other oil. It was not put on there on account of the value of the oil. A. As I have already said, that may be a case in point: where we have found, after providing these special facilities, which have no value for other purposes, that our business was attacked by a newcomer, we have, of course, endeavored to protect it.

Q. You put a premium on the oil which the Standard purchased after the American—you will remember that they built a line through to Philadelphia and established refineries there, and it became quite valuable. Now you put on a premium both in Butler county and in Washington county, those very large fields at the time, did you not? A. We undoubtedly did.

Q. It was taken off when you purchased, was it not? A. Undoubtedly and we would do the same thing again. We could not do less and be in the business.

Q. And you do not do that as a mode of discrimination? A. We do not; we do that as a matter of self-protection.

Q. And when you think you can do it in a legal way you do it whereas you can not give a rebate? A. That is it, precisely.

Q. Now, there is a pipe line in the Scio field in Ohio, and there is an independent line there, and there is a premium existing there? A. There is, but it is a question of quality. The Scio oil is of a very superior quality. We could not pay a premium for it with the light business that is being done were it not for the quality.

Q. But in the case I have referred to in Butler county and Washington county that was not a question of value, but of competition? A. It was competition, unquestionably. There were very strong competitors, and we were there to fight them, of course.

THE STANDARD'S STOCK IN INDEPENDENT COMPANIES.

Q. (By Mr. Jenks.) Several times in the course of the investigation statements have been made with reference to the very decided interest that the Standard Oil Company has taken in the Producers' Oil Company Limited. Statements have been made as to their buying stock in that company and attempting to get control of it. Will you give your version of that? A. We bought some stock in the Producers' Oil Company, Limited. We bought some stock also in the United States Pipe Line.

Q. About what proportion of the stock did you buy? A. Well, I could not state from memory—a fractional interest in the United States Pipe Line and a larger part in the Producers' Oil Company.

Q. A majority of the stock in the Producers'? A. No no; I should say considerably less than a majority.

Q. At any time? A. That is, in the Producers' Oil Company, Limited?

Q. Yes. A. To the Producers' Oil Company, Limited, we found such difficulty in the way of admission——

Q. (By Mr. Phillips.) I always understood that it was a little over half, and I want to be corrected by Senator Lee if that is wrong. A. Senator Lee, I think, is mistaken as well as yourself. We never owned more than one-half. The gentleman who bought ours, pending the ownership decision, did own a little more than half; we never did.

Q. It was under your control, and you worked in harmony? A. It was until we sold it.

Q. You worked in harmony with the other person? A. We generally work in harmony with him.

Q. You would in the management if there had been a change? A. If there had been a change we should have hoped for a better relationship, but it did not come. We bought that stock and were so opposed in the exercise of ownership that we sold it. We sold it in good faith, and the courts have upheld the ownership of Colonel Carter; that has been finally upheld in a most remarkable adjudication. The court held that he was the beneficiary, but because of some by-law on the books of the corporation he could have no voice in it whatever. We have no interest in it whatever, not even a dollar's worth. Our ownership in the United States Pipe Line was bought at a time when we thought that the business ought to become profitable. It was bought as an investment and with a view to having such knowledge as we could have rightfully through such ownership, as we could acquire in

the progress of the affair. There is nothing covered about it. Our ownership was contested by the gentlemen in charge of the property, and the courts have passed upon upholding our ownership, our right to own, and giving us our place and recognition on the board, and we have never done a thing to hurt the business of the company. We have been greatly pained that the results from it have not been more profitable, and we do not understand why they have not been. We think that one of these days, if that iniquitous voting trust is ever dissolved, the shareholders will awake to a feeling that somebody else than those who have managed it could do something for it.

Q. (By Mr. Phillips.) Did not all the shareholders agree to the voting trust? A. You got all of them to agree to it, but there have been some that want to get out of it mighty bad.

Q. Then you did control, through Colonel Carter, in the Producers' Oil Company, Limited, a little over half the stock? That was carried up to the supreme court. It was organized, a partnership, limited, in which the law itself requires the person to be admitted by consent of a majority of interest and stock in order to vote, and the by-laws recognized the same thing. The supreme court decided that purchase would not make your party a partner in that concern any more than, if I should buy a partner out in the dry goods business, I could force myself in. The law was gotten up for that special purpose, as it is understood in Pennsylvania, the same as the English law, was it not? A. I must correct you very positively, once and for all, when you say that we are controlling through Colonel Carter. We have nothing whatever to do with Colonel Carter. The purchase made by Colonel Carter of the stock that we owned was made in good faith, and he owns it entirely. He can give it away or tear it up without raising any question with us or anybody that I know of. The question of the decision of the law I am not here to criticise. I am not criticising judges or courts. But the law was a very queer one, that a man should be adjudged by the court the equitable owner of a majority of the stock, and then it should be ruled that because of some by-law of which he had not been cognizant, passed by the company, he could be kept out of any voice in the company. That is a very queer law, whether in New York or Pennsylvania or anywhere else.

Q. Did Colonel Carter buy that stock of his own instance? A. He did buy it of his own instance.

Q. And without any consultation or agreement with the Standard Oil Company? A. He was in a contention regarding the matter of his individual ownership, and he became enlisted in it and bought our stock, as I say, in the negotiation, the same as you, or I, or anybody else would buy it. We were glad to get out of it.

Q. You had purchased a large amount of stock? A. We had purchased a large amount, and we sold it.

SUSPECTS FREIGHT DISCRIMINATION AGAINST THE STANDARD.

Q. (By Mr. Jenks.) You have stated emphatically several times that you have received no discriminating favors from railroads at all since the passage of the inter-state commerce law. The statement is frequently made that railroads are making discriminating rates on freights of different kinds at different times. Have you, in your own business, met with opposition of that kind, or have you had reason to believe that your competitors were receiving special favors against you? A. Well, I would rather not go into that question. I do not feel that I am prepared to go into it. That we have strong suspicions on that line is true enough, but I am not here to make charges against other people. I am not prepared to do it. There might arise exigencies in the course of the testimony where it would seem necessary for us to look up the records; and if so, I shall be glad to do it.

Q. You have no evidence to give on that subject?

FAVORS PUBLICITY OF ACCOUNTS UNDER A NATIONAL CORPORATION LAW.

Q. You made a suggestion near the close of your direct testimony with reference to legislation. Would you consider it advantageous to the country as a whole to have greater publicity regarding the business of all of the great corporations that now exist? For example, with reference to the amounts represented by patents, by good will, the amounts that are water, and so on. In other words, would you consider it an advantageous thing for the country to have substantially the English corporation law apply in this country? A. If it could be put into Federal hands, yes.

Q. Into Federal hands? A. Into Federal hands; yes, by all means.

Q. And you would favor, then, the publicity of accounts, the making of reports to the Federal Government quite in detail? A. Oh, unquestionably.

Q. You would favor a law of that kind? A. I certainly would.

MARKET PRICE OF STANDARD STOCK.

Q. (By Mr. Phillips.) Will you state what the highest price is that the Standard Oil Company's stock has reached on the market? A. I think the present is about the highest price.

Q. What is the last quotation? A. I think 460 or 465.

Q. That would represent $460,000,000 or $465,000,000? A. If it could be all sold at that price.

Q. Do you object to stating the amount of dividends you have been paying? A. That is to go in the statement asked for.

(By Mr. Jenks.) I have furnished to Mr. Archbold one of the schedules prepared by the com-

mission, and that is to be filled and returned in ten days.

NO REBATES ON OIL OF OTHER COMPANIES—NO COMPELLING REFINERS TO SELL TO THE STANDARD.

Q. (By Mr. Ratchford.) Has your company received any rebates on the transportation of oil of other companies? A. It has not.

Q. What have you to say to the charge, so generally made against your company, particularly, I believe, in the Western States, to the effect that small producers and refiners are forced to sell their product to the Standard Oil Company? That is a phase of the question which, I believe, has not been touched upon today? A. I think we have gone into it very fully.

Q. What have you to say with reference to the charges, so generally made, to the effect that smaller concerns, individual producers and refiners, are forced to sell their product to the Standard Oil Company? This is a charge that is made in Colorado, and I want to give you an opportunity to deny it if it is untrue. A. It is untrue; there is no such compulsion of any kind, either with reference to the producers or refiners. In fact, we buy very little of the product of the small refiner—next to nothing.

Q. Your company has made no agreement with reference to such small concerns? A. No.

Q. Did the paper you have submitted in evidence here today state that certain other companies have received rates of transportation from certain points cheaper than your company received? A. I stated only the one case in connection with transportation of oils furnished by the Central Railroad of New Jersey to the United States Pipe Line. I furnished a statement on that.

Q. (By Mr. Kennedy.) There was testimony in Colorado to the effect that a distributing company there took all the products of the two refineries of the Colorado field, and Senator Hill, of Colorado, who owns one of these refineries, testified that the distributing company, or merchandising company, which bought all of this refined product, was the western concern of the Standard Oil Company. A. They may do so, but it is certainly a voluntary act on the part of the company refining the oil. There is certainly no compulsion about it.

Q. You said they do not buy? A. We do not here at the east—the Standard Oil Company. I did not have in mind the question of a possible purchase in Colorado of the local production; that might be so.

Q. (By Mr. Ratchford.) Is there not such a thing as cutting the prices on that distributing company and forcing them, through business reasons, to dispose of their product to your company? A. I do not know how we could do so. It might prove they were competent buyers.

Q. They hold otherwise. A. Their relation to the company—the distributing company—although I am not familiar with it, must be voluntary; certainly no compulsion about it.

AMERICA NOT IN THE MARKETS OF THE WORLD BUT FOR THE STANDARD.

Q. (By Mr. Smyth.) Do we understand from your testimony that you claim the Standard Oil Company has been of vast benefit to the oil industry in the United States and abroad? A. I believe that it has been of vast benefit to the country.

Q. Do you believe it has been a benefit to the American people? A. To the American people and the American producer of oil. I believe firmly that America would not have been in the markets of the world if it had not been for the Standard Oil Company.

OBSERVED THE STRICT LETTER OF THE LAW.

Q. Do you state, since the passage of the inter-state commerce law, in 1887, your company has not received rebates of any kind from the transportation companies? A. I think we have observed the strict letter of the law in all that pertains to inter-state transportation.

CAUSES OF STANDARD'S PROSPERITY.

Q Yet, since that period your company has prospered more than ever before? A. Yes.

Q. How do you account for that? A. One of the contributing features, in my mind, is the greater stability that has attached to the trade since the passage of the law; the extension of business, growth of business, and better utilization of by-products, and all that; but very largely the stability of business incident to the stability of rates through the inter-state commerce law.

Q. I suppose the Standard buys the best that is to be had? A. They are on the lookout for the best.

Q. And probably their success is due to their nerve and ability and money? A. It is, undoubtedly, and to the further fact, which I must repeat, that we treat the trade fairly. We realize fully that no business can have any permanent success that is not carried on on honest principles, and you will not find customers of ours complaining of our treatment.

A NATIONAL CORPORATION LAW.

Q. (By Mr. Clarke.) You have stated that you would favor the formation of national corporations. Would you have the capital of these corporations limited by law or by a national commissioner of corporations, or would you have it unlimited? A. I would have it unlimited, but would put upon its issue such restrictions as to value involved as would fairly protect the community; I mean the general public.

Q. You would have these national corporations

subject to the supervision of a commission or some other Government authority? A. Undoubtedly, as is the case under the English corporation law.

Q. Do you not think one of the greatest evils of State corporations is the lack of supervision? A. The lack of supervision, and the entire lack of uniformity as between the States.

Q. Do you think the formation of national corporations would overcome most of the objections that are now raised to combinations commonly called trusts? A. I do. I believe it would do away with the talk of monopoly, make every business free to all comers, within the law and under the provisions made.

Q. (By Mr. Kennedy.) Favoring national charters and national supervision as you say, would you go to the extent of favoring inspection of the books and affairs of each concern, as the national banks are inspected by Government officials? A. I have not made a study of the subject so as to make a statement in detail as to what the supervision and restriction should be. I should say that is a question that ought to be very carefully considered before expression is made, and I could hardly answer it today. On general principles, I favor all fair supervision and making of statements that would enlighten the public.

ADVANTAGES OF A GREAT AGGREGATION.

Q. (By Mr. Farquhar.) Is it not a fact that, since you control the products of petroleum in this country, when you acquire, by purchase or through the agency of your own men, the formula of a better way possibly of producing oil, you can beat all competitors by the fact that you can put it into effect in every single one of your plants? Has not that been one of the great reasons of your success in carrying your oil under a Standard title all over this country, and accepted as a standard wherever sold? A. Undoubtedly.

Q. An advantage that smaller concerns, independent or otherwise, can never obtain because they can simply work a formula within themselves, whereas you can put it in the hands of fifty or sixty? A. That is entirely correct. That is one of the great causes of success of our business, and comes from combination alike of capital and talent.

Q. (By Mr. Phillips.) Have you any further or supplementary statement to make, Mr. Archbold? A. Nothing.

Testimony closed.

Washington, D. C., September 9, 1899.

TESTIMONY OF HENRY H. ROGERS.

President of the National Transit Company.

The commission met at 10.30 a. m., Vice Chairman Phillips presiding. Mr. Henry M. Rogers appeared and, after being duly sworn, testified as to the oil industry.

Q. (By Mr. Jenks.) You may state your name and residence. A. Henry H. Rogers, New York City.

THE WITNESS'S CONNECTION WITH THE STANDARD OIL COMPANY.

Q. What connection have you with the Standard Oil Company, the Standard interests? A. I am president of the National Transit Company.

Q. Are you connected with the Standard Oil Company of New Jersey? A. I am one of the vice presidents of the Standard Oil Company of New Jersey.

Q. Your position is such that you would be entirely familiar with the questions discussed in Mr. Archbold's testimony? A. I think mainly so.

Q. You heard the testimony yesterday. Do you agree substantially with all that was said? A. I do.

REASONABLENESS OF PIPE LINE CHARGES OF THE STANDARD.

Q. You have been familiar with the pipe lines, their charges, etc., for several years? A. I have.

Q. About how long is it since the charges on the pipe lines were lowered to 20 cents? A. I think, as Mr. Archbold testified, it was about twenty years ago.

Q. Can you give us any explanation as to why it is that the pipe line charges have remained substantially the same for twenty years, whereas the railways and prices in general have decreased very decidedly? A. You will understand the pipe line charges of 20 cents are what are termed "gathering charges"—that is to say, the oil is taken from the wells of the producer and delivered to the stations of the pipe line and the tanks. Wherever the oil is found we run a line to it. We are frequently called to run a line 15 or 20 miles. We never object; we make no extra charge for that. In some instances we pump oil but a very short distance to the tanks, and in some instances we pump it 15 or 20 miles, so that we consider it an average charge, really, rather than an arbitrary charge.

Q. (By Mr. Farquhar.) You mean not an average but an equalizing charge? A. An equalizing charge, if you please to term it so.

Q. (By Mr. Smyth.) Based on the circumstances of the producers in the same fields? A. Yes; and because the producer, if he is a patron of our line, is at liberty to feel that no matter where he finds oil in the vicinity of the pipe line—it may be 15 or 20 miles away; but if he is a patron and has a producing well of paying size, we will spend the money and run the line to him and take care of his oil.

COMPETING PIPE LINES.

Q. Is there any competition in the pipe line business? A. Yes.

Q. What is the competition? A. The competition in the Butler field is with the Producers and

Refiners' Pipe Line. The competition in the Ohio field is with the Manhattan Oil Company, and in the Indiana field with the Cudahy Company.

Q. (By Mr. Phillips.) Is there any competition in the Scio field in Ohio? A. There is a trifling competition. The production in that field is about 6,000 barrels a day, and the run of the outside lines is probably between 400 and 500 barrels a day.

Q. (By Mr. Jenks.) These competing lines run into the same territory, so that they might equally well take the product? A. If they had the capacity to handle it.

Q. So far as the location is concerned? A. So far as the location goes.

Q. Are the prices of these independent pipe lines in Pennsylvania the same as yours? A. I do not know. I have hearsay evidence, but that is all.

PREMIUM ON OIL IN VARIOUS FIELDS.

Q. (By Mr. Phillips.) Have you any premium on oil in any competing field except the Scio field? A. Yes.

Q. What other fields—the Tiona and Franklin field? A. The Tiona—the Franklin field is a lubricating oil field. The oil is superior to the ordinary petroleum.

Q. And the oil in the Tiona field is also superior, as it is generally understood? A. Yes.

Q. Now, the Scio is a newer field. Do you understand that to be somewhat superior? A. It is.

Q. Mr. Archbold testified yesterday that you had applied premiums on oil in fields where there was no special difference in the quality of the oil, as, for instance, in Butler and Allegheny and Washington counties, when there was competition there. Do you understand that to be substantially correct? A. I understand Mr. Archbold's statement to be absolutely correct.

A PREMIUM NOT A REBATE.

Q. He testified that you put these premiums on, but did not give a rebate. I would like you to explain to the commission the difference between putting a premium of 10, 15, or 20 cents per barrel on oil and granting a reduction in transportation prices on it. Would it not in effect be the same? A. First I would like to say that as I understand Mr. Archbold he did not testify that we had been the first to put the premium on the oil; that it had been brought about by competition. I do not think the money that goes into the pocket of the producer as an advanced price could be classed as a rebate, because he loses interest in the oil as soon as it goes into the pipe line. The pipe line charges are paid by the man who transports the oil for refining, the exporter.

Q. Did not all who shipped in these fields get an advantage over other producers in other fields the same as if it was a rebate? Is it not another name for the same thing? A. No; not nearly so, as I have explained. The producer loses interest in the oil from the instant when he delivers it to the pipe line. If he gets a premium on the oil, the producer is benefited by it. He has surrendered it to the man who owns it after it goes into the pipe line, for refining or for sale to foreign markets, for export. The producer has no interest in the oil after he parts with it at the well.

Q. Could he get a larger price for it if there was a larger price on that oil? A. I could not answer such a hypothetical question as that.

NO PREMIUMS AT PRESENT EXCEPT FOR SUPERIOR QUALITY.

Q. (By Mr. Smyth.) Do we understand, then, in the instances of fields where you say there is a premium, that it is due to the superior quality of the oil? A. It is.

Q. (By Mr. Phillips.) At the present time? A. Yes.

Q. (By Mr. Smyth.) I understand there is no premium now except in two cases where the oil is of superior quality? A. There are three points.

Q. And at these points there is a premium? A. There is a difference in the price of oil in Ohio There are two fields in Ohio, the North Lima and the South Lima. The oil of the North Lima field is more valuable than that of the South Lima field, and there is a difference in the price of five cents.

Q. That difference goes to the producer. A. Yes.

DISCRIMINATING FREIGHT RATES IN CANADA.

Q. (By Mr. Jenks.) We received some information yesterday with reference to the interests of the Standard Oil Company in Canada; it was said you had some refining interests there. About what proportion of the refining in the Canadian fields do you do? A. I am not familiar enough with that branch of the business to answer. Mr. Archbold, I think, will furnish that.

Q. Have you any information as to an advance of rates from Buffalo and Toledo through to Montreal or other Canadian points in the latter part of 1898 or the first part of 1899? A. I never heard of it.

Q. You did not hear that any complaint was made by Canadian oil dealers to the railroad committee of the Canadian parliament with reference to discriminating rates on part of the Canadian Pacific and Grand Trunk? A. I heard something about it, but am not posted as to details.

THE DISSOLUTION OF THE TRUST—FRACTIONAL SHARES RECEIVE NO DIVIDENDS.

Q. When the Standard Oil Trust was dissolved, in what form did the certificate holders receive their claims on the various companies that have been combined in the Standard Oil Trust? A. In what form of certificate?

Q. Yes. A. First, I think, they had to surrender their certificates, and receive a certificate that gave them equitable ownership in these constituent com-

panies, and then that certificate was exchanged for actual stock in the company.

Q. There were some twenty constituent companies? A. Yes.

Q. In the case of a holder of two or three shares of stock, would he receive fractional shares in each one of these companies? A. Yes.

Q. Did these fractional shares receive their dividends the same as the others? A. No.

Q. In that case, if a person had held less than twenty shares of the trust certificates he would not receive dividends from the different companies? A. No; I believe it is for legal reasons.

Q. Does that mean that these holders of trust certificates, who have only fractional shares in these various companies, have not received any dividends since the trust was dissolved? A. That is as I understand it.

Q. Is that a reason why the trust certificates have been surrendered so slowly on the part of many? A. I could not answer that; I do not know.

AMOUNT OF OIL THAT THE PIPES HOLD—AMOUNT OF CREDIT BALANCES AND CERTIFICATES.

Q. (By Mr. Phillips.) About how much oil does it require to fill the pipe lines of the National Transit system in the Pennsylvania and Virginia field? A. I never figured it. I can give you that information if you will give me twenty or thirty days' time; it is a mathematical calculation.

Q. One witness estimated the amount sufficient to fill the lines as about 4,000,000 barrels? A. The amount of residuum in the bottom of the tanks is published every month by the National Transit Company. That is a matter of public record and can be had.

Q. About how much oil has recently been standing out in the shape of credit balances and certificates at the end of each month? A. I can not answer, but we can furnish that from the monthly statements published in the office; that information is given to our Oil City and New York offices every month and published in the Oil City Derrick. Do I understand you would like to have it for a period, Professor Jenks.

Q. (By Mr. Jenks.) Yes. A. You are welcome to it.

CREDIT BALANCES IN NATIONAL TRANSIT COMPANY.

[In barrels of crude oil of 42 gallons each.]

Time.	Barrels.
June 30, 1889	3,217,749.16
December 31, 1889	3,160,156.81
June 30, 1890	3,794,873.84
December 31, 1890	2,758,654.30
June 30, 1891	5,403,170.38
December 31, 1891	3,201,351.34
June 30, 1892	5,987,319.53
December 31, 1892	5,532,079.21
June 30, 1893	4,340,713.15
December 31, 1893	2,705,563.20
June 30, 1894	2,453,417.82
December 31, 1894	1,644,255.13
June 30, 1895	783,592.96
December 31, 1895	1,809,325.78
June 30, 1896	3,275,075.49
December 31, 1896	4,215,060.28
June 30, 1897	5,413,417.10
December 31, 1897	4,523,054.39
June 30, 1898	4,450,703.02
December 31, 1898	3,822,997.28
June 30, 1899	4,910,451.22
September 30, 1899	5,349,392.54

As to the capacity of the lines, that would be a very difficult thing to say. We probably have 35,000 miles of pipe, or more, scattered all over the country, 2 inches, 2½, 3, 4, 5, 6, and 8 inches in diameter. Now, to figure out just how many miles there are of each and how much oil it would take to fill it is a great mathematical problem.

Q. (By Mr. Phillips.) We only want an approximation. You could probably tell within four or five hundred thousand barrels. A. We could do that, certainly.

(Estimate supplied later: The estimated amount of what is known as Pennsylvania crude oil in pipes of 5 inches in diameter and over of the National Transit Company and connecting pipe lines, as of 7 o'clock a. m., October 1, 1899, in barrels of 42 gallons each, is 535,528 barrels.)

RELATIONS OF VARIOUS "INDEPENDENT" COMPANIES TO EACH OTHER AND THE STANDARD.

Q. (By Mr. Smyth.) There was a matter mentioned yesterday that several of the commissioners did not thoroughly understand. That was in reference to the pipe lines in which the Standard Oil Company owned a half interest; I think it was in Pennsylvania. A. The Oil Producers' Company, was it not?

Q. No; I understand the Standard Oil Company owned a half interest and sold it to Colonel Carter, but under some decision of the courts of Pennsylvania he is not allowed to control or manage that company. We wanted to ask who owns the minority shares. A. I only know from rumor; rumor is that Mr. Phillips and his friends——

Q. The Pure Oil Company? A. Not the Pure Oil Company. The Pure Oil Company is a company, you understand, that contemplates the ownership of the Oil Producers' Company, the Producers and Refiners' Pipe Line, the United States Pipe Line Company, and numerous refineries in the oil regions and one or more at the seaboard. In practice, it would prove to be a repitition of the Standard Trust—a very wise thing to do, I concede.

Q. These individuals that own a minority of the stock, according to the testimony, really control the management of the company? A. It would seem so.

Q. (By Mr. Ratchford.) Are they an organization? A. I think an organization under the Pennsylvania law.

Q. (By Mr. Smyth.) What is the name of that pipe line? A. The United States Pipe Line is one and the Producers and Refiners' Pipe Line is another.

Q. Does this ownership that the Standard Oil Producers' Company as I understand it, own and control an interest in the Producers' Oil Company, Limited, and the Producers' and Refiners' Pipe Line Company. The answer to Mr. Smyth's question is, as I understand, that the Producers' Oil Company own and control an interest in the Producers and Refiners' Pipe Line, which line gathers oil in Butler and adjoining counties, and the Producers and Refiners'.

Q. This company was the United States? A. The Oil Producers' Company, Limited.

Q. And the minority of stock, you think, is held by individuals? A. I think so, but I do not know.

Q. You state the Standard Oil Company has no interest in it? A. None whatever.

MR. CARTER'S STOCK AND HOW HE GOT IT.

Q. (By Mr. Farquhar.) Was it conceded in the opinion of the court that Carter did positively own a majority of the stock? A. I so understood it.

Q. You could not positively give testimony as to that? A. Only mere hearsay.

Q. (By Mr. Phillips.) Was not Mr. Carter furnished the money to buy that stock by a trust company in New York? A. That I do not know; I think not.

Q. And he was introduced to that company by a member of the Standard Oil Company? A. What was the name of the company?

Q. I do not remember the name. A. He may have been introduced to the company; I could not answer for the moment. I suppose if Mr. Carter or Mr. Phillips came to me I would feel perfectly free to introduce them.

Q. (By Mr. Smyth.) It is not an unusual thing? A. Not an unusual thing to borrow money.

Q. (By Mr. Phillips.) Did we not understand Mr. Archbold yesterday to state that the Standard Oil Company, or the trust, or the United Pipe Line, controlled a majority of this stock at one time that was sought to be voted by Colonel Carter? A. He testified, I think, that the Standard Oil Company did not ever own any of the stock, but the parties in said——

Q. But the affiliated companies under the control of the Standard Oil Company did A. It seems to be a question of memory between Mr. Lee, Mr. Archbold, and me as to whether Carter owned a majority of the stock or we owned a majority of the stock before his purchase.

Q. Can these facts be fully ascertained by the proceedings and hearings in New York? A. There were no proceedings brought there.

Q. I am not certain whether it was brought there or not, but I so understood it. There were some proceedings and some testimony taken in New York. A. I never heard of it. I would like to say that Colonel Carter did commence an action in Pennsylvania, and the court decided that he was a bona fide owner of the stock and ought to be allowed to vote it, but under the rules or by-laws he could not do it.

Q. And that was carried to the supreme court and affirmed? A. I could not testify to that; I know nothing about it.

Q. (By Mr. Ratchford.) I was going to follow my previous question with a second one, but others were interjected. This organization (and I would like to have you mention the name of it) is an organization under the law of the State of Pennsylvania? A. Which company do you refer to?

Q. The company to which you refer as "Mr. Phillips' friends," the oil producers, the Pure Oil Company. A. The Pure Oil Company is an organization under the laws of the State of New Jersey.

A GENERAL FEDERAL INCORPORATION LAW IS DESIRABLE —ITS ADVANTAGES.

Q. (By Mr. Clarke.) Are you acquainted with the anti-stock watering laws of Massachusetts? A. I am not.

Q. You favor Mr. Archbold's suggestion about conducting such large interests as you are now carrying on under a national corporation? A. Most certainly, and I would like to explain. I think the English law, as referred to yesterday, is most desirable in its operation, and is most encouraging to capital and protecting to labor and to everybody interested.

Q. Would you be willing, in case there should be a general corporation law of the United States which seemed to be fair and equitable, to organize under that law and transfer or abandon your organizations under the State laws? A. Most assuredly.

Q. You would favor publication of records and a supervision of stock issued by Federal authority? A. Certainly.

Q. (By Mr. A. L. Harris.) I should like to ask Mr. Rogers whether he has investigated that question from the legal standpoint, to know whether it can be done under the present Federal constitution? A. I should judge, from all I have heard, that it can not.

Q. (By Mr. Kennedy.) You would be in favor, then, of amending the constitution so that it can be done? A. I believe, if we are going to be the greatest commercial nation in the world, that the constitution ought to be amended so that Federal charters can be granted on such plan as the English.

Q. (By Mr. Farquhar.) Has not the United States already granted a charter in the matter of the Nicaragua canal? A. I understand special charters have been granted by the Federal Government under the old constitution; but to make such a change as is contemplated here it should be applied to no particular corporation, but should be general and should cover everything.

Q. You would rather have a general provision that they could incorporate under, without special authority of Congress? A. I would practically use the same machinery in the Federal Government that is now used by the several States.

Q. As a business man, would you state the advantages that you see in these Federal corporations as to

commerce and the public generally? A. The advantage would be, in my judgment, the power to do business under the Federal law, subject only to such laws of the States as pertain to taxes and the police regulations that govern in our States.

Q. And that supreme regulation and supervision should be vested in the Federal authority? A. Yes; so far as legislation is concerned it could rest with the Federal Government very largely.

Q. Also, I suppose, that would lessen litigation in respect to corporations?? A. I think so, decidedly.

Q. Is not that one of the features the Standard people would naturally propose as an amendment to the constitution? A. We are rather case-hardened. We are getting along in years, but we think the new and younger industries would be benefited very materially.

OVER-CAPITALIZATION REGULATES ITSELF—GOOD WILL MUST BE ALLOWED FOR.

Q. Now, as to this question of over-capitalization? A. That always regulates itself.

Q. Do you take it now that the organization of these companies in New Jersey, with the enormous capitalization that some of them have and of which a large part, in a good many instances, is watered stock, is detrimental to business generally and ultimately amounts to swindling? A. Of course, there may be a large amount of watered stock of that kind, and undoubtedly many of them could be reproduced for less money than is put into them; but we must not forget that in the organization of great businesses a great deal of time, labor, and money has been spent that can not be accounted for. Take a newspaper in New York City; it has a large circulation; its plant could probably be reproduced for a hundred thousand dollars; it would sell readily for $100,000. Now, a certain amount of allowance for good will must necessarily go with any business. It is practically the same as the case of a lawyer. A man with years of experience and standing in the law very naturally receives larger fees than the younger man who has just taken his diploma.

Q. Is there only one thing covered by over-capitalization—that is, good will? A. That is generally the thing. There may be another; that is patents.

Q. Would good will enter into the issue of bonds? A. I should not say it would enter into the issue of bonds, because the party would probably examine the papers to see that there was absolutely enough property on which to rest his security.

Q. If a man is making a mortgage trust on it, do you suppose the good will would enter into that? A. Not at all.

Q. So the foundation of your public security ought to rest, for the benefit of the public and the safety of the public, on intrinsic value instead of fictitious good will? A. Certainly, on the underlying security.

SPECULATION CAN NOT BE REGULATED—WE SHOULD HAVE FEDERAL CHARTERS.

Q. Do you not think that in the enlargement of these great combinations in this country, the whiskey trust and others, the great harm has come from issuing stock, as in England, and hoodwinking the public? A. No doubt a good deal of that has been done, and many of these industries have gone to the wall for lack of management. You can not regulate speculation as long as it is born in use to gamble, and there happens to be a Wall street and a Lombard street. There is no law that compels a man to go into Wall street to speculate, and experience has shown us that it is a dangerous place. I think we should say to the public, "Here is the property. You can investigate it if you want to, and if your are satisfied with the security you can put your money into it, and if you are not satisfied with the security don't put the money in."

Q. Do you think it is right for any State like New Jersey to incorporate these companies? A. We can not very well discriminate.

Q. Do you think it is comity between the State that there should be such an open law as in New Jersey, and such a close law as in New York? A. I think it would be decidedly better if all could agree upon something sensible and reasonable in that respect. Of course the laws of New Jersey have recently been followed by Delaware in liberality, and all the bad will naturally go to New Jersey and Delaware for incorporation. I think a Federal charter would do away with that evil.

Q. Remedy all these evils? A. I do.

IS THE "GOOD WILL" OF A NEWSPAPER COMPARABLE WITH THAT OF AN ORDINARY BUSINESS?

Q. (By Mr. Jenks.) With regard to your illustration of an example of the value of good will in an enterprise, is it a fair parallel for ordinary business corporations? Is it not true that newspaper success depends upon the individual capacity of one man rather more than does the ordinary corporation? A. I know very little of the newspaper business, but I know this: in a business way it is largely successful through the amount of enterprise put into it by the head of the newspaper, the standard of excellence, and capable people. The good will of the paper is established by reason of its money-earning capacity, and that might be true of a corporation.

Q. To the same extent? A. That would depend on circumstances, amount of capitalization and amount of business. You can give the illustration of a valuable patent.

Q. That is exceptional also. A. Yet at the same time it is monopolistic.

Q. That it is. The point of the question is this: In case of a patent we have a monopolistic element capitalized; in the case of a newspaper we have the individual talent of the manager, influential to a greater extent than in ordinary corporations. That might be

capitalized? A. Still men come and go, but newspapers continue and their value increases.

Q. Sometimes it decreases very rapidly when the head man goes? A. I refer to the New York papers.

OVER-CAPITALIZATION SETTLES ITSELF BY DEPRECIATION OF STOCK.

Q. (By Mr. Kennedy.) You said that over-capitalization in combinations settles itself finally. Will you state how in your opinion that is done? A. If the corporation is over-capitalized and unable to pay dividends on its capitalization, its stock will depreciate in value. Investors first look for the security and then at the amount they get for their money. They will take a little gamble on the over-capitalized company if it will pay them. They will invest in stock that sells for 75 and pays 6 to 8. They will take chances rather than put it away in their pockets.

Q. (By Mr. Smyth.) You stated that you thought the question of good will ought not to enter into the valuation on which bonds should be issued; but do you not think that in the capitalization of a large industry or combination the question of good will enters into the value of the stock? A. I do.

THE ATTITUDE OF NEWSPAPERS TOWARD THE STANDARD AND ITS OPPONENTS.

Q. It was stated by Mr. Boyle in his testimony that, of his knowledge, in Pittsburg numerous articles attacking the Standard Oil Company were published form time to time gratuitously as communications, but that the replies of the Standard Oil Company, when made, always had to be paid for, even if published in the local or news column. Can you give us any information about that? A. I do not think we have undertaken to answer these anonymous communications very much. I know of one case where I, at one time, undertook to get in a little communication in reply and I received a bill of $12. I paid it.

Q. The Standard receives no favors from the papers in general in the way of defending them or publishing their communications? A. I think the papers publish a good many things prejudicial to the Standard Oil Company, perhaps through ignorance about it. We are so busy we do not have time to think much about it, but I think the newspapers mean to be generally pretty fair. Undoubtedly they would open their columns freely if we cared to talk, but talk is so cheap we prefer to keep sawing wood. We have not had our side of the case fairly presented, perhaps.

THE STANDARD WILL DO WHATEVER IS FAIR FOR THE HOLDERS OF FRACTIONAL SHARES.

Q. (By Mr. Jenks.) You said some time ago that the holders of the fractional shares in the constituent companies that formerly composed the Standard Oil Trust did not receive dividends. Will you explain that a little more clearly? Does that mean, as has been intimated here on the stand, that the holders of these fractional shares lost every opportunity of receiving any returns from these shares? A. I think that is a legal question that I can not go into. I think that fractional shares we have issued have had as a denominator about 975,000, and the numerator would range—I could not say where, but it was very small, so that the participating interest was so trifling that it would be impossible to pay a dividend.

Q. In this reorganization that has lately been made by the New Jersey corporation is there to be an opportunity for the holders of these fractional shares to get their stock back in such form that they can receive dividends? A. Whatever is fair we will do. We will treat everybody fairly, and if there is anybody here that has anything of that kind I would like to confirm it now, and perhaps Mr. Archbold will indorse it.

THE CHARTER OF THE NATIONAL TRANSIT COMPANY.

Q. (By Mr. Phillips.) What is the capital stock of the National Transit Company? A. I think $25,000,000.

Q. What kind of charter has it? By whom was it granted? Was it a special charter?? A. I think it was a charter granted by the State of Pennsylvania a good many years ago and termed a special charter. It was granted to a company of another name, but by due process in the Pennsylvania legislature we received this special charter. Of course, after the constitutional convention in the State of Pennsylvania, held twenty years ago, no special charters were granted; so we have an advantage in that charter. Practically it is the same charter that the Pennsylvania Company has that is owneed by the Pennsylvania Railroad, under which, in turn, the Pennsylvania Company owns the stocks of the lines west of Pittsburg.

Q. The charter is very liberal in its terms, is it not? A. Yes; I think it is.

Q. What did the National Transit Company pay for that charter? A. As I was not an officer or connected with it, I could not tell you.

Q. Do you not know there was a very considerable sum of money paid for that charter? A. I should suppose every good thing had to be paid for; I should say a man who owned a charter of that kind would sell it at the best price he could get.

THE WITNESS DOES NOT KNOW THE COST OF GATHERING OIL.

Q. There was a question asked you about the expense of gathering oil, and you illustrated by pipe lines going out a long distance to take care of oil. You have no special knowledge in regard to what the cost would be in the gathering of this oil. Have you any idea of the profit in gathering this oil at 20 cents a barrel? A. I could not answer that; but I could probably say and be confirmed by you that we are not in the business for our health, but are out for the dollars; what that profit is I could not say.

Q. The charge is the same as it was when the transit

company was first organized, notwithstanding the cheapening of everything and the new means of doing business? In your opinion it has cost 6 or 8 cents to do this? A. I do not know.

Q. What is your charge for carrying oil to the seaboard? A. Forty-five cents to New York.

Q. Was it not testified to by one of the members of your company, or an employe of the company, that the cost did not exceed 7 cents, or about 7 cents? A. I never heard of such testimony.

Q. It is not a difficult matter to determine after a pipe line is established. I suppose that almost any member of the company would know, approximately, what the cost was, and I think it is a fair question. A. Oh, no; it is not difficult—but you must let me say that there are a great many things I do not know.

PIPES ARE TAKEN UP AND RELAID.

Q. (By Mr. Smyth.) The cost of laying pipe lines today would be immensely greater than it would have been one or two years ago, would it not? A. I think the advance is as much as 100 per cent in some material.

Q. In the cost of pipe material? A. Yes.

Q. Now, if a pipe line is abandoned on account of the giving out of the oil, of course, a pipe line in that locality is of no earthly use or value? A. There is a certain amount of salvage; it can be taken up and used elsewhere. If the oil business were to die out, then the value or amount of the salvage would be very trifling; but so far as material is concerned it can be used a second time. It has a certain value.

Q. Do you ever take up the lines and transplant them? A. We change from one field to another. We utilize our old material when we can.

Q: That, of course, is a great expense? A. There is a great expense involved in doing it—labor chiefly.

THE CHARGE FOR PIPING DOES NOT AFFECT THE PRODUCER—TWENTY CENTS VERY REASONABLE.

Q. You do not think, then, that 20 cents a barrel, being the uniform price, is excessive? A. I consider it very reasonable.

Q. Has there been any demand on the part of the producers to reduce that charge? A. I think there have been demands of the producers; I think it has been pretty well established now that it does not matter to the producers what the pipe line charges are; it is the man that buys oil from the producers.

Q. The oil is generally bought from the producer at his well, practically? A. Practically at his well. The receipts are given there for it by the pipe line, and the receipt is a merchantable receipt.

Q. In your opinion, the standard or average price per barrel for transporting this oil through pipe lines, regardless of cost, is best for all producers of oil? A. We think so, because of the varying character of the business, the new fields that are constantly getting on, the decline of the oil, and the wearing out of the pipes, or rather their usefulness.

Q. (By Mr. Farquhar.) How does 20 cents a barrel in pipe lines compare in cheapness with any other class of transportation—railroad, wagon, or otherwise? A. Oh, it is so infinitely cheaper that it cannot be compared .

Q. (By Mr. Smyth.) What is the greatest distance you carry oil at 20 cents a barrel? A. I do not think that I can answer that specifically.

Q. Well, approximately? A. Approximately, I think we carry 25 or 30 miles.

COMPETING LINES COVER ONLY LOCAL FIELDS—CIRCUMSTANCES OF THE BUSINESS.

Q. That is cheaper than the railroad companies deliver? A. Why, certainly. May I explain a little and say our affiliated interests, so to speak, of the pipe lines gather the oil in Ohio, Indiana, West Virginia, Pennsylvania, and New York? All competing lines gather in some small local field, as for instance, the Producers and Refiners' lines. It has occurred to me—I have heard that their charge was 15 cents a barrel for refiners, but they only gather within short distances. I do not know what they are. I will say that we are willing to run a line 15 or 20 miles, and do it for the patrons of our line at times. I do not know whether they do that or not; I do not think they do, because I think they are confined to a district.

Q. I suppose you investigate a well very thoroughly before running out 15, 20 or 25 miles? A. Naturally we look into the business.

Q. But at the same time there is a certain amount of risk as to the perpetuity of the well? A. Yes.

Q. All that risk you assume? A. We do.

Q. (By Mr. Farquhar.) Is the only salvage the pipe, when you abandon a well? A. That is all.

Q. (By Mr. Smyth.) You have to buy the right of way generally? A. Sometimes—we always expect to pay for it. It is worth having and worth paying for.

Testimony closed.

Washington, D. C., September 9, 1899.

TESTIMONY OF MR. THOMAS W. PHILLIPS.

At a meeting of the commission, Saturday, September 9, 1899, Mr. A. L. Harris presiding, Mr. Thomas W. Phillips appeared before the commission at 11.15 a. m., and, after being duly sworn, testified concerning trusts.

Mr. A. L. Harris. I have been called to the chair at the instance of the vice chairman, in order that he may give some testimony as a witness to the commission. Mr. Phillips desires to make a statement in his own way.

PERSONAL STATEMENT—THE PURE OIL COMPANY; ITS VOTING TRUST.

The Witness. I desire to refer to the statement which two witnesses have made before the commission that I am connected with a trust. They assume that I am

here, as a member of this commission, opposing trusts, thus giving the impression that I have prejudiced the case. This is what they imply in alleging that I am connected with a trust.

I am free to state that I am connected with a corporate organization the object of which is to combine several interests in the same company, namely, the Pure Oil Company, organized under the laws of New Jersey. A fraction over one-half of the stock of this company is in a voting trust. The sole duty of the trustees is to act with the other stockholders in electing directors. The trustees have no right to manage the business affairs of the company. The stockholders have consented in writing to this voting trust. The reasons for creating it are as follows:

PRODUCERS' OIL COMPANY, LIMITED; ATTEMPT OF THE STANDARD OIL COMPANY TO CONTROL IT.

A very large number of the independent producers in the oil country organized a number of years ago what is known as the Producers' Protective Association. I was the first president of that organization. As a means of protection the Producers' Oil Company, Limited, was formed in June, 1891, with a capital of $600,000. Shortly after the formation of this company the Standard Oil Trust, through one of its affiliated companies, the National Transit Company, commenced to buy the stock of the company and continued to do so until it had accumulated a small per cent over half the stock. It paid in some instances as high as 220, or 120 per cent above par, and this at a time when the company had not yet earned any money, but had, in fact, lost money. The members of the Standard Oil Company say that they afterwards sold this stock; but before the time when they claim to have parted with it they turned it over to Mr. Carter, to whom they allege they afterwards sold it, and he attempted to vote it at an important meeting of the company as his own and secure control. This was March, 1894. He returned it to the National Transit Company after his fraudulent attempt to use it as his own to accomplish a purpose which the Standard Oil Trust evidently desired. Subsequently, on the 16th day of January, 1896, the same individual alleged that he purchased the stock from the National Transit Company. It was proven in evidence that this person was introduced to a trust company in New York, from which he borrowed the $300,000 with which the purchase was alleged to have been made. When it was attempted to show that this money came from the Standard Oil Trust, the witness, Mr. Archbold, and other agents of the Standard Oil Trust declined to answer all important questions touching the ownership of that money. The Producers' Oil Company, Limited, declined to permit Mr. Carter to vote the additionally acquired stock, amounting to $297,000, without first being elected to membership by a majority in number and value of the interests remaining in the company.

This was in accordance with the statute of Pennsylvania of 1874 and the supplement of 1885, creating and regulating limited partnerships. A by-law of the company also provided that such election should take place before admission to membership.

As to his effort to vote this stock without being elected, the decision was against him in the court of common pleas of Warren county, Pa., after a two-weeks' trial, and an appeal was taken by Mr. Carter, the alleged owner, to the supreme court of Pennsylvania. That court decided that both according to the letter and the spirit of the statute he was not entitled to vote that stock as a member of the company without having been elected as indicated above. That decision I have here and submit it to the commission as sustaining the position which the company took.

THE STANDARD OIL COMPANY GETS A MEMBER ON THE BOARD OF DIRECTORS OF THE UNITED STATES PIPE LINE COMPANY.

The Standard Oil Trust, through the same affiliated company, the National Transit Company, acquired large amounts of stock in the United States Pipe Line Company, another company organized by the independent oil producers and refiners. This company was formed to transport refined and crude oil to the seaboard. The aim of it was to cheapen transportation and to avoid discriminating rates. The United States Pipe Line Company excluded the Standard from its meetings on the ground that the Standard acquired its stock to compass its destruction and to get information that would lead to the destruction of the independent movement.

Mr. Archbold stated yesterday that one of the objects of the Standard in buying that stock was to secure information. The National Transit Company brought a bill in equity to secure admission to the meetings of the company and permission to vote that stock. The decision in the lower court was in their favor. On appeal to the supreme court, the case was prepared on both sides with elaborate briefs for argument, and counsel on both sides were present in the supreme court to argue the case. When it was called, instead of proceeding to argument upon its merits, counsel for the National Transit Company moved to quash the appeal on the technical ground that the affidavit to show that the appeal was not "taken for the purpose of delay" was not made by the chief officer or secretary of the company; and the supreme court, because the statute required such an affidavit, quashed the appeal, and the case was not heard on its merits. It was then too late, under the statute, to take another appeal and have the case heard on its merits.

The entire stock acquired by the National Transit Company in the United States Pipe Line Company was $383,000 out of a total of $1,190,000. To defend these two companies from the hostile invasion of the Standard Oil Trust cost about $15,000 in actual money, besides vast labor and trouble.

THE PURE OIL COMPANY NOT A TRUST.

Because of the attempt of the Standard Oil Trust to force themselves into these independent organizations, without invitation and against the will of all

the independent members, it was thought wise in the organization of the Pure Oil Company to have at least half of its stock put into a voting trust in the names of men of known and tried loyalty to the independent interests. This was done solely for the purpose of securing that company against the hostile inroads of this great monopoly and to prevent its destruction.

The Pure Oil Company is not a trust in the commonly accepted sense of that term. A trust, as I understand it, is a corporation or combination of corporations with vast capital, organized for the purpose of securing a monopoly in any branch of trade. The Pure Oil Company is not organized for the purpose of securing a monopoly, but to prevent a monopoly and preserve competition in the petroleum industry, its promoters believing that by fair competition the highest and best interests of producer and consumer can be secured and the public interest best conserved.

It was therefore incorrect for the witness yesterday to state that the Pure Oil Company is a trust, or that any of the independent producers or refiners are members of a trust, in the obnoxious sense in which that word is understood, meaning monopoly.

The Standard's dividends will show, perhaps, without regard to the surplus they have accumulated, that they have at times made more profit on every barrel of oil they handled than they paid to the producer for it. I have known a producer to pay $100,000 or more for a limited numebr of leases, on which wells were obtained which would flow from 2,500 to 3,000 barrels per day: and yet the profit that the Standard Oil Trust reaped on each barrel of oil from these wells was evidently more than they paid for the oil.

As to amount, or as to the principles involved, the tax on tea and other articles, against which our forefathers revolted, was nothing in comparison to the tribute the Standard has levied on the oil producer and consumer.

THE STANDARD OIL COMPANY'S AVERAGE PROFIT.

During the time the Standard Oil Trust has been engaged in the oil business they have made more than $1 per barrel on all oil produced. This is capable of easy demonstration. The entire production of what is known as Pennsylvania oil for 17 years in round numbers is 500,000,000 barrels. The market value of the Standard stock is very close to $500,000,000. This has been made chiefly out of the profits of the company, and it is practically equivalent to $1 a barrel on all oil produced since they have been in business. During this period, or from the time the Standard came into power, oil has averaged about 90 cents a barrel; their profit has been more than a dollar per barrel. This does not take into consideration their enormous dividends nor their vast reputed surplus.

PROFITS OF THE INDEPENDENT REFINERS.

Q. (By Mr. Smyth.) That has been the profit of the independent refiners, too? A. No, sir; not by a great deal.

Q. You could not give an estimate of the profits made by the independent refiners? A. Upon this I am not well informed. I will say this: For a number of years they lost a very considerable amount of money. They sold what is known as cut cargoes. At the close I will give all the information I can, and will submit a statement of all the companies with which I am connected. I have reason to believe the companies will not object.

Q. Will that statement be made today? A. I should not have time to do that today, but will be willing at any time to submit a complete and full statement.

THE STANDARD OIL COMPANY—THE VALUE OF ITS STOCK REPRESENTS PROFITS.

Q. (By Mr. Kennedy.) I should like to ask why, if you are able to state the profits of the Standard Oil Company, you are not able to state the profits of your own company? A. That is very easy to answer, I think. I have given the facts of their stock; it is a very large concern, and we know the market value of their stock; we could not estimate the market value of our stock. For my own part I would not take a hundred per cent.

Q. (By Mr. Smyth.) How do you know they have made a profit of a dollar a barrel? A. Their capital stock has been selling at about $500,000,000, and there has been about 500,000,000 barrels of oil produced since they organized and the average price of that oil has been about 90 cents. This is saying nothing about the enormous dividends they have paid—I believe last year it was $35,000,000—nor anything about their surplus. There is no kind of question of my deduction and figures.

Q. That is only an estimate or guess? A. It can not be considered so in view of the fact that they built their lines and establishments out of their profits.

Q. How do you know that? A. We have every reason to believe it, because of the capital stock with which the company was originally organized and the dividends that they have made. They built it in that way.

VALUE OF STOCK IN THE STANDARD AND IN THE PURE OIL COMPANY.

Q. (By Representative Livingston.) Have you any exact way of getting at the market value of your stock or the Standard Oil Company's stock? Are both of them listed on the market? A. No; they are not. The Standard has always kept its stock from being listed on the market, though the papers give quotations of it from time to time. Ours is not listed on the stock market; there have been only individual sales; I can give the costs of our company, though, and the profits; then you can better judge what the value is.

Q. What would you take for your stock? A. Now, since we have won against the greatest opposition that ever existed in the commercial world by cutting our way through to Germany and getting a market there, I consider this stock very valuable, even though we sell at lower rates.

Q. What would you take for your stock? A. I

would not, under the circumstances, take 100 per cent profit.

Q. At how much can you buy Standard Oil? A. I think it was stated yesterday that the last market quotation is at the rate of about $465,000,000. It has sold within a fraction of $500,000,000 within a year.

PRODUCERS CAN NOT AFFORD TO SELL THEIR INDEPENDENT OUTLETS...THE STANDARD MAKES PRODUCERS AND CONSUMERS PAY FOR WHAT IT BUYS.

Q. (By Mr. Kennedy.) You say you would not take 100 per cent profit? A. I would not sell now. I will make a statement here in that regard, since the matter is brought up. In our best judgment, i. e., that of the most intelligent producers, when the Standard buys a pipe line system and refineries they are charged up to the producers. At the time of one of their largest purchases the price of oil was put down 7 cents per barrel the day the purchase was made, or the next day after. They were then shipping about 60,000 barrels per day through the pipe lines; and that 7 times 6 would be 42—$4,200 per day that they assessed to pay for that. And I heard Mr. Archbold say that the producers would never know what that pipe line cost them. And we do not know today; but the price was assessed, and a short time afterwards oil was dropped again. Now, along that line I could state this, that the Standard has bought very large amounts of property when oil is very low, and especially in 1895, when oil went up from less than a dollar to $2.60. They bought a number of million dollars' worth of producing property. It is fair to say that that property did not cost them anything, because the world, the consumer, was assessed for it. In my best judgment the Standard in purchasing either pipe lines or producing property, since its organization, has not paid any money directly that they have not recouped indirectly. When they buy a pipe line they levy the cost on the producers by dropping the price of oil. They buy large amounts of producing property when oil is low, and then the price to the consumer advances. They fix both the price at which they buy and the price at which they sell.

Q. You consider this stock to be worth a premium of 100 per cent on the par value?? A. Prospectively. You see, I would not sell it, because I am a producer of oil, and I am thoroughly convinced, and it is understood by the directors, that if we were to get twice its cost from the Standard we should be assessed to pay for it. We do not know how much money the producers have been deriving through the existence of these companies. We would not sell as long as we are producers; we keep the stock for self-preservation.

OIL MONOPOLY DUE TO LACK OF CONTROL OF RAILROADS.

The Witness (continuing his statement). Mr. Archbold stated before this commission that he was in favor of the Interstate Commerce Commission. If there had been a commission with proper authority over the transportation of oil, the Standard Oil monopoly would not be in existence today.

I am present as a member of this commission with a full determination to hear impartially, and to endeavor to the best of my ability to suggest such remedial legislation as will be for the greatest good of the greatest number; not only in regard to combinations, but also with respect to all industrial questions.

NEGOTIATIONS OF INDEPENDENT PRODUCERS WITH THE STANDARD OIL COMPANY.

In regard to the statement that I, in company with others connected with the independent movement, called upon the Standard Oil Trust seeking a combination with them, I will say that we did call upon them some three or four years ago. It was after they, or their affiliated companies, had bought the large amounts of stock, spoken of above, in our independent companies. They had bought a number of the independent refineries connected with the independent pipe lines. They had made every possible effort to prevent our marketing oil in Germany and other places. They had bought out Mr. Poth, who was handling the oil of the independent refineries in Germany. They had got almost complete control of the German petroleum installation plants or receiving tanks. The remaining refineries, as well as those who had sold out, had met with great losses in handling oil in Germany, selling what they call "cut cargoes."

The object in calling upon them, as far as I personally was concerned (and I believe it to have been the object of the other persons who was with me at the time, and who were men of the highest character), was to obtain from the Standard Oil Trust cessation of hostilities, both in regard to piping the oil and in regard to selling it. It was to secure the right to deliver in New York, without their opposition, the capacity of the then existing lines, which would not exceed seven or eight thousand barrels of oil per day.

We believed then and still believe that the opposition to laying our pipe lines across the State of New Jersey to reach the harbor of New York was instigated by the Standard. I am informed that Mr. William Rockefeller, a trustee in the Standard Oil Trust, is a director in the principal opposing road, the Delaware, Lackawanna and Western Railroad.

The members of the Standard Oil Trust with whom we conversed—and Mr. Archbold was one of them—refused absolutely to grant us any concessions, or to allow us, on any fair basis, to ship and market oil without such aggressive opposition as Mr. Archbold admits they employ to defeat competition. But in lieu thereof they proposed to buy our pipe line system, a propostion which we did not entertain. It was then proposed by one of the members of the Standard Oil Trust to buy our producing property. This was also rejected, as we did not desire to go out of the producing industry. No proposition was made to those gentlemen by me or by any gentleman with me, to the best of my knowledge and belief, on that occasion or any other, that any fair and honorable business man could not make to another.

I had not then and have not now any conscientious scruples about anything that was said to them, and should be perfectly willing, were it possible, to have all the conversation that occurred repeated now before this commission.

THE STANDARD OIL COMPANY DESIRES THE CO-OPERATION OF THE INDEPENDENT PRODUCERS.

In regard to the statement that they had not entertained a proposition for combination because of lack of faith, both in the legality of the proposition and in the men connected with the independent movements, I have this to say: That there has never been a time when I should have been willing personally to go into a combination with the Standard Oil Trust. In proof of this I will state that in the year 1890 I sold to the Standard Oil Trust quite a large oil field in Butler county, Pa., composed of 7,500 acres of land held by lease, with 125 producing wells. The chief reason for selling this property to the Standard Oil Trust was at that time they had purchased the Union Oil Company's interests and those of the Anchor Oil Company and the McKinney Brothers' property and also the Forest Oil Company's property, these being the largest oil properties in the country.

The Forest Oil Company was negotiating for my property before they sold to the Standard. After having sold their interests they stated that the Standard would purchase mine if I so desired and the price could be agreed upon.

Fearing the power of the Standard, fearing that they might reduce the price of oil, and considering that they had bought the largest properties in the oil field, I concluded to enter into negotiations with them for the sale of the property. The negotiations continued for two days at their office, 26 Broadway, New York. During this period, at two or three times when we differed in regard to the value of the property, they asked me whether I would act in harmony with them. At each time I absolutely refused to consent to this proposition, and finally stated that if they should insist upon that as a condition I would not sell; that I was willing to sell my property, but would retain my individuality; that I had nothing to sell but my property. They bought the property for $750,000, which was paid partly in cash and partly in stock. I subsequently sold the stock for a less price than I took it at in payment for the property, not desiring to be connected with them in any way.

As further evidence that the Standard Oil Trust desired my co-operation: A few months after the sale of this property, while spending a short time at Lake George with my family, I met Mr. Dodd, the attorney of the Standard Oil Trust, at the Fort McHenry House. In talking to my son and myself in regard to the Standard Oil Trust, he said that the Standard always sought connection with successful men, and, turning to my son, said they had sought "your parent." This conversation is fixed most distinctly upon my mind because of the use of the word "parent."

As a result of these large purchases which the Standard made, the vendors became active in the producing departments of the Standard Oil Trust. I presume that it was there that they desired my work or influence.

There is not now and there never was any inducement that the Standard could hold out to me sufficiently strong to induce me to become an active participant in their business.

The statement that they declined any business arrangement with the independent producers because of lack of faith in them can not be true and in a gratuitious insult to a large body of business men of the character. For four years they have been trying to force business relations with us by buying large blocks of stock in the companies and going into court to force us to receive them as business associates, and they have so far succeeded as to have a director in the United States Pipe Line Company. The statement is, therefore, both false and slanderous.

COST OF PIPE LINE TRANSPORTATION.

Q. (By Mr. Kennedy.) What is the cost per barrel of transporting oil through the United States pipe line? A. I am informed that with the line carrying half the capacity, about 3,000 barrels a day, it is about 5 cents per barrel to the terminal in New Jersey, and with full capacity of the line it would cost less than 4 cents. In the gathering in the field I have had personal experience connected with lines, and we estimate from 3 to 5 cents per barrel, and yet the Standard's price is 20 cents per barrel.

Q. Twenty cents? A. Yes; it is the same now as when they were organized.

NO RECENT OVERTURES TO THE STANDARD OIL COMPANY.

Q. It was stated under oath yesterday, I think, that you had called upon Mr. Archbold for the purpose of combining with the Standard Oil Company since the organization of this commission, and you state positively under oath that this is falst? A. I positively state it is false. I have nothing to do with them except as I have set forth here. If others have called upon them, it was without my knowledge, advice or approval.

THE PURE OIL COMPANY— ITS VOTING TRUST.

Q. You stated that this voting trust, in this company with which your are connected, vote simply for directors and have no voice in the management of the business affairs of the company. Do not the directors, who are their creatures, have the control of the affairs of the company? A. Oh, yes; those who are elected. The trustees have a majority of the stock, and they vote with the other stockholders and elect a board of directors. They expect to elect men of character and ability to conduct the business affairs of the company, just as any other corporation would be conducted. It is expected that everything will be open to inspection. It will be if I have my way. I do not think there will be any objection to furnishing to this commission at any time, or to the State or to the Uuited States, a

statement of any of these lines, or a full statement of the Pure Oil Company, which will probably absorb the lines in the manner I have stated.

Q. Well, is it not true that this voting trust of five members, who vote more than the majority of the stock, do manage the affairs of the company through this board of directors? A. Yes. The voting trustees are fifteen. The number was made large in order that they might be representative throughout the oil country. They do elect the directors. That is the object of it, and I have fully stated the reason why it is done, to prevent being crushed by this great monopoly. It was the only means of safety, as we have learned by experience. And I will further state that voting trusts are not uncommon either in Europe or America. It is nothing new to have a voting trust.

THE PURE OIL COMPANY'S VOTING TRUST NOT SIMILAR TO THE STANDARD OIL TRUST.

Q. Will you state how this voting trust feature of your company differs from the old Standard Oil Trust's manner of doing business? A. The voting question?

Q. Yes. A. At the present time?

Q. Yes. A. I know nothing about their methods of later years, except that one suit was brought against them in Ohio to dissolve their trust, and they agreed to dissolve it. I know of persons holding certificates of the same trust and receiving dividends on them up to a very recent day; but it was also acknowledged here yesterday that they were still paying dividends on these trust certificates.

Q. Was not the old Standard Oil Trust, through a voting thust, electing a board of directors to manage the affairs of the trust? A. No; they were a close corporation, as I understand.

Q. A what? A. What we would call a close corporation. I mean a trust, a body of men associated together in the most secret form, probably, that exists in any business enterprise of magnitude. They themselves conducted their business, and they would make no statement to the public. The most I heard, at the time when they bought this property, from another individual, was this: He said he had had the privilege to look at what he called their quick assets, and they were enormous. That was in 1890. I do not know about their business affairs since that.

Q. You state then that this voting trust feature of yours is not similar to the old voting trust feature of the Standard Oil Company? A. Not in any way, manner, or form. It has been fully explained, and the object of it has been fully explained. I have nothing to conceal about my public transactions in connection with that business or anywhere else.

Q. I ask because the Standard Oil officers have testified in respect to this that you began where they left off. A. Well, if they said that, they said what is not the truth. The matter is fully before the commission, and the only object of the voting trust is the one I have stated.

THE REPRESENTATIVE OF THE STANDARD OIL COMPANY ON THE BOARD OF THE UNITED STATES PIPE LINE.

Q. (By Representative Livingston.) I have an allegation here, by a party who signs his name to it, that the Standard purchased stock in the name of a spy sufficient to place one director on the board of each of the "following companies," and yours is included, the Producers'. What do you know about that? A. From what do you read?

Q. I am reading form a letter signed by a man. It does not make any difference who he is now. Has the Standard Oil Company a member on your board of directors? A. Yes; they have a member on the board of the United States Pipe Line Company. They failed to secure an election in the other company, although they had a majority of the stock, as I explained. One of their members, one that is openly connected with them, though not in a managing capacity, is on the board.

Q. On your board? A. On the board of the United States Pipe Line. I have stock in it, and I am also a director in it, and I have met with him.

Q. There are several companies here mentioned in which they did purchase stock enough to put one member on the board, among them the Producers and Refiners' Oil Company and the United States Pipe Line Company. Now, this man charges that the Standard Oil Company and your company and these other two companies are one and the same thing, by a private understanding, to this extent—that you sold stock enough to the Standard to authorize them to put a member on your board and on these other boards. Is that correct? A. No; it is absolutely false.

Q. Do you mean that it is false in toto—that you have not a member? A. No, I said we had a member, but we did not consent; the stock was bought without our knowledge and consent, and he was forced there by law.

Q. I understand that. They had purchased stock enough to force a member on your board? A. And forced him on us. They said they would not be associated with any of these affiliated companies because of lack of faith both in their ability and in their honesty.

Q. Of what advantage to the Standard Oil is that member of the board of directors in your company? How can they utilize him? A. They get all the information. That is, he is called to all the meetings and treated like any other member of the board.

Q. Then they find out all your secrets in that way? A. The witness, Mr. Archbold, yesterday testified that it was one object in purchasing the stock—to get information. We have never had a doubt of their purpose in any of these purchases; that the purchases were made for the purpose of destroying or crippling our industry and breaking down opposition to them.

Q. I will show this letter both to yourself and to the representatives of the Standard Oil Company. [Representative Livingston here produced a letter and handed it to the witness.]

Q. I just request, if I am not present when you get through with the letter, that if any representative of

the Standard Oil Company be present he may have the same use of it. A. If any use is made of it by one side the other shall have the same privilege.

"MONOPOLIES"—THE STANDARD OIL COMPANY NOT A MONOPOLY BY LAW.

Q. (By Mr. Ratchford.) In the early part of your testimony you observed that your company is not a trust, but a combination. Do you understand that it it chartered under the State of New Jersey, as is also the Standard Oil Company? A. Just recently the Standard Oil Company has been chartered, as has been testified here.

Q. You also define a trust to be a monopoly. Now. I want to ask whether the laws of New Jersey give to the Standard Oil Company any advantage that is not given to your company? A. Not so far as I know. All these large combines that have been organized under the laws of New Jersey are organized alike, as I understand it; some have preferred and common stock, and others just common, etc.

Q. The combination or trust has no privilege before the law, as you understand it. That being the case, then the Standard Oil Company is only a monopoly in the State of New Jersey providing they are able to monopolize the business. Is that right? A. Yes.

Q. If that be correct, then it follows that your company will also be a monopoly, provided you are able to monopolize the business? A. Both companies have a perfect right——

Q. (Interrupting.) They have the same right under the law? A. Yes. We organized under the same law.

Q. What I meant to ask was whether they had any special privileges under the law? A. I understand all of these great industries organized in the State of New Jersey are organized under this same law and have the same privileges.

THE PURE OIL COMPANY ABSORBS ITS ALLIES—THE STANDARD ABSORBS ITS COMPETITORS.

Q. Another statement I understand you to make is that the Pure Oil Company will eventually absorb the other lines. A. It will purchase a majority of the stock of the independent lines.

Q. This is the company you are interested in? A. I am interested in all of them; I am interested in all four of the independent companies.

Q. From your standpoint I want to ask if the absorption of smaller enterprises is not the greatest objection that has been urged against the Standard Oil Company? A. Certainly; but these independent companies are practically one already. The producers formed one organization, and then another and another. The stockholders are the same, or very nearly the same. They are simply getting together because the Standard was likely to absorb them in detail. But if organized in this protective form, with a voting trust, it will be impossible for the Standard to buy the stock and control these companies. It is self-defense.

Q. But is it not in every case the purpose of the larger companies to absorb the smaller competitors? A. I do not know the purpose of others, but it was the purpose of this Pure Oil Company to unite—if you please, to consolidate—the companies in one, because practically the stockholders were the same. It was not to get control of any other person's business; it was simply to put our own business in such a form that we could not be destroyed by this giant monopoly.

Q. In your experience with the Standard Oil Company has that not been one of its objects—to absorb the smaller concerns? A. The smaller concerns that have been absorbed have been independent and opposition companies. These are not, and the cases are not similar.

THE PURE OIL COMPANY, UNLIKE THE STANDARD, DOES NOT DESIRE A MONOPOLY—THE WITNESS WOULD REFUSE TO BE CONNECTED WITH A MONOPOLY.

Q. (By Mr. Clarke.) Did your company compete with the Standard Oil Company in any operations in the field? A. Yes.

Q. You would get business away from them if you could honestly and fairly? A. Certainly; that is, in an honest, fair manner. Competitors will always do that.

Q. You get away all their business if you could honestly and fairly, I suppose? A. It would be very difficult to do that.

Q. Well, suppose you could?

Q. (By Mr. Farquhar.) There is the same object before the two trusts, your company and the Standard? A. I would not say so. I would say that we only want a fair portion of the competitor's business, not the whole of it. I would not be connected with a monopoly. I would not control a great product and fix the price at which I could buy, transport, and sell. It is too great a responsibility for any one man to have, and it is a greater responsibility than tyrants as a rule assume toward their subjects. The profits are enormous which have been fixed by this trust.

Q. Now, you wish us to understand that if this company should become large and be an octopus you would sell out and be no longer connected with it? A. I would not be connected with it.

Q. If your company should be large enough to monopolize the business by means of fair competition, you would no longer have anything to do with it? A. I would not have anything to do with it if it pursued the methods of the Standard, influencing legislation and preventing others from doing business. If it grew naturally and the profits were fair, I should be willing to accept them, but I certainly should not want the responsibility of monopolizing a great industry and fixing the prices. I do not think that such a power should be in any hands. I would be in favor of throwing it open to Government inspection and of requiring public statements and of putting it under any laws that would be fair and just to the people.

Q. You would not, then, if you could, by perfectly fair and legitimate means, irrespective of the means of the Standard Oil Company, monopolize the oil business in any way? A. I would not. I say I would not have the responsibility of fixing, according to my own

judgment, what my profits should be from a great community. I would rather die poor than have it.

Q. That would be a matter of your own conscience? A. Yes.

Q. How would it be under the law? Do you consider that it is not legal for any company to gain all the advantages that it can fairly and legitimately? A. Well, now, I have pretty strong views in regard to competitors and competition, and being a member of this commission, I would rather not enter into this subject and give my views in regard to it now.

"TRUSTS"—DIFFERENT MEANINGS OF THE WORD—THE PRODUCERS' OIL COMPANY AND THE STANDARD.

Q. (ByMr. Farquhar.) The witness states here that the Pure Oil Company, so called, is not a trust. Will you explain to this commission why it is that your articles of agreement all through characterize it as a trust? There are five articles in your agreement. It explicitly declares in the first article (reading):

"First. The equitable ownership of the trust shares and all interests therein shall be subject to the terms of this trust agreement. Such ownership of the shares, or interests therein, may be sold at the will of the holder; but no sale, transfer, or conveyance of such ownership or interests shall give to the purchaser any rights other than are provided for in the by-laws, rules, and regulations of the company; and in accordance with this trust the trustees hereunder shall at all times be recognized as the legal owners and holders of the trust shares to carry into effect the purposes of this trust, and all equitable owners of trust shares or interests therein shall specifically agree in writing to the terms of this trust, and no transfer of any such shares or interest shall be made, or be effective if made, unless the transferee of such equitable ownership or interest shall have agreed in writing to receive and hold the same subject to the provisions of this trust."

The objects set forth in the original trust of the Standard are the same objects, with just one exception, as are claimed for this Pure Oil Company. How can it be possible to escape the idea that this Pure Oil Company is a trust? What explanation have you to make? A. It is a voting trust. The company itself is organized under the laws of the State of New Jersey, and all those trust papers, as I understand it, were drawn solely for the purpose of protecting the stockholders in voting this stock and electing directors. The stock itself was put into a trust, a voting trust, so that it could not be sold or alienated or monopolized, and if the stock were sold the trustees would have a voice in electing directors.

Q. How do you explain here in the fourth subdivision of this agreement (reading)

"Fourth. This agreement may be cancelled, and the trust hereby created dissolved, only by the winding up of the Pure Oil Company, or by the consent in writing, duly executed, of the equitable owners of four-fifths of the shares held in trust hereunder, and of four-fifths of all the other shares of the company, after providing in full for the redemption or purchase at $110 per share, in cash, of all the preferred and common shares of the company at the time outstanding."

Is not that trust pretty nearly perpetual? Is not that company a perpetuity? A. I do not so understand it, because it provides for its own method of dissolution.

Q. How do you provide for dissolution? Because under the general laws, that is under the power of the trustees, and you have trustees here who hold the entire property in their hands; they make their own board of directors; the administrative power of your whole concern is in men who are creatures of your trustees. How much worse than that is the whisky trust or the Standard Oil? A. I have defined my meaning of the word "trust," and it has been often repeated that the intention in that agreement was only to preserve this stock intact, so that the Standard Oil Company could not monopolize it. I have explained how they attempted to monopolize one of the companies.

ADVANTAGE TO PRODUCERS FROM THE EXISTENCE OF INDEPENDENT REFINERS.

Q. Do the producers who sell oil to independent refiners get better prices than producers who sell to the Standard? A. That varies at different times. In the beginning, when the Standard had so stopped the outlet abroad and had so monopolized everything and thrown everything in the pathway, the producers got together and made sacrifices for the benefit of the refiners. They were selling cargoes at great loss, and we gave them a reduction in the pipe line charges. There were other times, when the market was good, when the pipe lines have sold to the refiners at a profit. Now, in this recent advance the Producers and Refiners' Pipe Line advanced the oil three cents more than the Standard. The Standard in a few days came up to it; and then they advanced again to $1.37 and this line advanced it to $1.40 .They were very anxious, however, to get the oil to win the fall trade.

Q. That was simply incidental? A. Yes; incidental. They have been competitors in every way.

Q. Now, at the present time, is not the market on all fours to the producers, whether they are sellers to the independents or the Standard? As prices go, does it pay the producers to sell to the independent refineries as well as to the Standard? A. Yes; they have the privilege of selling to the other pipe lines. There is sometimes, as I said, an advance by the one and not by the other. But this line has never paid the producers less than the Standard was paying. It has always kept pace with the Standard in advancing, and very frequently has advanced 1 or 2 or 3 or 5 cents more. We are handling the high grade oil—Pennsylvania oil. That is very desirable both at home and abroad.

Q. Now, I would like to know what the character of the competition is that caused the United States Pipe Line to put it up 10 cents more. Was it the Standard? A. That forced the United States?

Q. Or the refiners or other pipe lines? A. No; we did not do that.

Q. I thought you said they raised 3 cents and then the Standard raised 3? A. Yes.

Q. Was it the presence of the Standard that forced them up? A. I do not know how that would be.

Q. Well, it is a business proposition? A. It is a business proposition that in order to benefit their friends the refiners were perfectly willing to make the advance; furthermore, it was the time of year when they wanted to get this oil to ship abroad and to supply the markets at home.

Q. What I want to get at is whether the producers expect greater benefit through this pipe line company or through the Standard in selling their oil. A. We believe that were it not for these companies, the price of oil would be much less than it is. We believe that as large producers we have reaped great benefit from the competition, limited as it is. It is remarkable what a little competition may accomplish; they do not overlook small things. They have the power of a giant, and they use it as a giant.

Q. I want to know if these producers are any better off in connection with this independent organization than they are with the Standard, as far as prices go; then I want to have the question answered, after that, whether the refiner pays the extra profit that is paid into the hands of the producers. A. There is no doubt, in my judgment, that the producers are better off on account of this independent movement. There is no doubt that the independent refiners are better off. If it were not for these pipe lines none of these independent refiners would be living to-day. It is for mutual protection that these people have united. We believe we have received much better prices for oil; the last year the refiners have given much better prices than they would have given if there had not been this independent movement.

Q. You have stated repeatedly, or, rather, it has been stated repeatedly before this commission, that the Standard has made inordinate profits. Now, is it a fact that the independents are not making as much money, either as refiners or producers, as the Standard people are? I am not talking about commercial reasons at the seaboard. I am speaking about the field, because the producer is not concerned with anything outside of the Pennsylvania field and Ohio field. A. I think that as far as production is concerned they are substantially on a par; but as far as the selling is concerned the Standard have an adantage, because they have an accumulated capital to handle all the by-products with, and so on, as the others have not.

Q. So we come to this plain business proposition, that the producer is just as well off dealing with the Standard as he is with this Pure Oil Company? A. No, indeed; I would say not.

Q. Why is he not? A. Because when there is no opposition they pay much less prices. My judgment is, while we could not prove it, that the price of oil has been so much better that we have already paid for the plant out of the increased prices that the Standard has paid for oil on account of this opposition.

Q. You said one minute ago that the advance made by the independents was three cents, and was met by the Standard with another advance. A. How do we know but the oil would be 50 or 60 cents to-day if it were not for this organization?

Q. That is entirely hypothetical. I want to know if they are better off. A. I said that they are better off; the producers are better off, probably by 25 cents per barrel, on account of this opposition to the Standard.

PROFITS IN THE OIL BUSINESS.

Q. These men that are engaged in the independent movement have made money out of the oil business? A. A great many of them are quite well to do, but a majority of the producers are comparatively poor.

Q. Many of them are millionaires? A. Some of them have made a great deal of money.

Q. So these men who are co-operating with you are millionaires and the Standard is simply a greater aggregation of millionaires? A. I do not know the wealth of those gentlemen, but very few are considered millionaires. I am quite sure they would have much more wealth if prices had not been depressed by the Standard.

Q. Of course that is a business question, just like railroading. The largest corporation is going to make the most money. A. I have given facts and figures here which will convince anybody, I think, that the Standard have been making more profit on each barrel of oil than they have paid for it. Now, that affects both the producer and the consumer.

Q. What I wanted was to find out whether these producers are able to get their share of the proper profits that belong to them? A. The producers could not have received their share of the profits when it is a fact, as has been shown, that the Standard makes more on each barrel of oil than they pay the producer for it.

CAPITALIZATION OF THE INDEPENDENT COMPANIES—VALUE OF THEIR STOCK.

Q. (By Mr. Smyth.) Will you tell us what is the capital of the Pure Oil Company—the amount it is capitalized at? A. Something over $400,000; but there has been an application to increase it. It is my recollection that the authorized capital originally was $1,000,000, $377,000 of which was paid in.

Q. What was the value of the different companies associated with or controlled by the Pure Oil Company? A. None of them are controlled by it as yet. It is a marketing company; but there is an effort, which we presume will be successful, to combine a majority of the stock of the others, as I have explained, into this Pure Oil Company, with an increased capital.

Q. What would be the aggregate value of these

companies? A. There is about $3,000,000 invested in all these companies to-day, as I understand it.

Q. Then you propose to increase the capital of the Pure Oil Company? A. Yes; it has been proposed to increase it.

Q. Has it been decided to what amount? A. It has been thought we would probably increase it to $10,000,000. Q. Now, in your judgment, the value of that stock would be about $20,000,000? A. No, not at all.

Q. I understood you to say a short time ago that you would not take a hundred per cent advance for your stock? A. I should not feel like taking a hundred per cent for my stock in all these companies, because I think I am benefited in various ways by getting a better price for my productions.

Q. (Interrupting.) Now, you think that this Pure Oil will be a competitor in the market for the benefit of the consumer? A. For the benefit of the consumer and the producer.

THE FOREIGN MARKET—THE STANDARD WAS NOT THE PIONEER.

Q. Can you tell us what portion of the products of these companies with which you are connected goes abroad? A. About 40 per cent of the crude we handle, I am informed by the president of the company.

Q. How long have you been exporting 40 per cent of your crude? A. About two or three years.

Q. Was your company the first to export oil, or was the Standard Oil Company the first to open up the market? A. Oh, they were not; there was a large amount of oil shipped abroad before the Standard existed.

Q. One must have been first. A. The Pure Oil Company was organized in 1895, and the Standard Oil Trust, I am informed, was organized in 1882, and of course shipped oil abroad before the Pure Oil Company; but millions of barrels of oil was exported before the Standard Trust existed.

Q. They did not go into the refining business as the Standard Oil Company for a number of years after the discovery of oil? A. No.

Q. You do not consider the Standard Oil Company the pioneer in building up the export business? A. Not at all; no.

Q. At the same time they had a large proportion of it to meet? A. Oh, certainly they did, but they were not the pioneers.

Q. And covered the world, as we learned yesterday from Mr. Archbold? A. Yes; but others preceded them in almost all countries. I do not believe, as was stated by Mr. Archbold yesterday, that they have better talent than others engaged in the same business.

AGAIN THE QUESTION OF MONOPOLY.

Q. Now, the charter of the Pure Oil Company is taken in the State of New Jersey, and the charter of the Standard Oil Company is now being taken there. You spoke of the Standard Oil Company as the Standard Oil Trust. Yet you deny that the Pure Oil Company is in any manner a trust; how do you distinguish them? A. The Standard is a monopoly. The Pure Oil Company is not.

Q. How can the Standard Oil Company be a monopoly when the Pure Oil is not? The Standard Oil Company handles only 80 per cent of the product. A. It does not require all of any commodity to make a monopoly and fix prices; anyone knows that. They do have a sufficient control to make a monopoly.

Q. You stated just now that you had advanced the price of the crude oil to the producers, and then the Standard had. So you were not alone in fixing the prices? A. That was in one locality, and in advancing crude oil.

Q. But, as a fact, it was done? A. Yes; that is, where our pipe lines went; and I may say the advance was universal over the field.

FREIGHT RATES AND REBATES—THE INDEPENDENTS HAVE NOTHING TO CONCEAL.

Q. Mr. Archbold stated that he was distinctly and clearly in favor of the interstate commerce law, and since the passage of that law in 1887 he affirmed and gave positive testimony that no rebates, no special rates on freight, no advantages of any kind, had been offered by any railroad company or transportation company or canal, or accepted by the Standard Oil Company or asked for by them. Do you say the same for the Pure Oil Company and the companies with which you are connected? A. Yes; to the best of my knowledge and belief there has been nothing of that kind.

Q. No special rates have been given your company at all? A. No; not unless you consider contracts made when we could not get through to New York. Of course there was a rate through to New York when our pipe line reached a certain point in New Jersey, and when it reached a certain further point there was a lower rate, etc. The freight was very large, and it was the only way we could get oil through to the market. It was an open rate.

Q. It was a special rate to your company? A. No; it was an open rate. They probably had no other shipper of crude oil from that given point, but it was in proportion to the rate from other shipping points, from Oil City, for instance, through.

Q. Wasn't it less than by competing lines? A. Not that I know of.

Q. Could it have been without your knowledge? A. Yes, possibly.

Q. You could not say from your own knowledge? A. I will say that there are other witnesses that will come here and give you the facts. We are perfectly willing to aid you and show whatever there is in the whole business. We have nothing to conceal whatever.

Q. Would you be willing to give a list of the dividends paid by your companies? A. Yes. I am assuming this, that we would be perfectly willing

to have all our companies, and certainly I should be willing to have anything that I am in, open to State and governmental inspection; and if it was doing any injury I would not object to having it either abolished or restricted.

Q. You stated positively that, to your knowledge, no rebate has been received or accepted by any of your companies since the passage of the interstate law? A. Not to my knowledge.

Q. Do you know of any such rebate being given to the Standard Oil Company? A. Personally I have no absolute knowledge on this question, but have been told and believe they have received such rebate. I will qualify my former statement. Pipe lines may have sold to independent refiners at special rates, as stated heretofore.

Q. To that extent it was a special rate extended to the Pure Oil Company? A. No; it was to the refiners. The Pure Oil Company is a marketing company.

THE FOREIGN MARKET—RUSSIAN OIL—DISTRIBUTION OF PETROLEUM WOULD HAVE BEEN WIDER IF THE STANDARD HAD NOT EXISTED.

Q. When you entered the German market you found the Standard already there? A. Yes.

Q. And you got in and competed with them? A. Yes; we entered into competition, as anybody had a right to do, and we found the competition a very bitter one. At least the refiners did.

Q. Did you find the Russian competition there? A. There is very little Russian oil sold there now.

Q. In Germany, as far as your knowledge goes? A. There is very little Russian oil shipped to Germany.

Q. But there was a very large amount of Russian oil shipped to Germany before the Standard went in? A. They were not the pioneers. My own judgment is that there would have been a better distribution of oil, better both for producers and for consumers, and they would have been more fairly treated, if there had been competing companies instead of this monopoly.

Q. You do not think the Standard Oil Company has been a benefit? A. The Standard Oil Company? I don't believe I should be willing that one railroad should control 80 per cent of the passenger and the freight traffic of this country and have the absolute power to fix rates. I think we should have had wider distribution of petroleum, and the public would have been better served, and the producers would have been better remuneratd, if it had not existed.

Q. (By Mr. Farquhar.) Do you believe that any of the independent refiners or producers of this country, any number of them, could ever have reached the field that the Standard have all over the world unless they combined? A. Yes; the markets of the world were largely reached before the Standard combination.

PROFITS OF THE STANDARD OIL COMPANY AND OF THE PURE OIL COMPANY.

Q. (By Mr. Kennedy.) Can you state what profit the Pure Oil Company makes per barrel of oil? A. I will have the officers present that. I have not gone over it in detail. We have no public records of the amount.

Q. You have private records? A. Yes; but I have not examined into this matter. I will present the exact figures. It has varied at different times. We have met with great losses, and sometimes we have made some profits. I would state this, that the profit would be less than 10 cents a barrel at the present time.

Q. While the Standard profit is more than a dollar a barrel? A. It seems to me that the data given show conclusively that the profit is more than a dollar.

Q. And the Standard can make a profit of a dollar a barrel and you can only get a profit of 10 cents? A. We have met with this great opposition. We expected to make more than that perhaps after a time; but if we should average 10 cents a barrel and could do one-fourth of the business the Standard does, the company would get enormously rich. If a party of capitalists had purchased the right from the Standard in the State of Pennsylvania—where we could not get any free pipe line for a long time—to manufacture and sell one-fourth of the oil that the Standard did when they were organized, they could have made two or three hundred million dollars very readily had they been willing to exact the prices the Standard did. It would have been a splendid investment to have bought the right from the Standard to do business in this country without their opposition.

THE STANDARD OIL COMPANY HAS AN ADVANTAGE IN THE USE OF BY-PRODUCTS.

Q. You have stated that the Standard Oil Company has made more profit from a barrel of oil than the Pure Oil Company. Is that in any measure due to the fact that they use the by-products? A. Yes; that has considerable to do with it.

VALUE OF STANDARD AND PURE OIL STOCK—PROFITS.

Q. (By Mr. Smyth.) You wish us to understand that your company, on a profit of 10 cents a barrel, is to be considered worth 200, whereas the Standard Oil Company, on a profit of a dollar a barrel, is only worth 465? A. I have tried to explain that before. I am a producer of oil, and as a producer I would not sell my stock for twice the amount; and then I do anticipate very fair profits in the near future.

Q. Do you think the Standard Oil Company makes a thousand times the profits you do? A. For a long while we made nothing, as has been testified, and I think some of the witnesses testifying in the interest of the Standard charged us with using

people's money in some of these companies and not paying them any return, but we do not know how much the return has been in the advanced price of crude oil.

Whereupon the commission took a recess until 2 o'clock p. m.

Washington, D. C., September 11, 1899.

TESTIMONY OF MR. LEWIS EMERY, JR.

The commission met on Monday, September 11, 1899, Vice Chairman Phillips presiding. Mr. Lewis Emery, jr., appeared at 10:55 a. m. and being duly sworn, testified as follows:

PERSONAL STATEMENT.

The Witness. Mr. Chairman and gentlemen of the commission, in advance I desire to beg your indulgence in giving my testimony from this fact, that I have been absent from my home, in the State of California, for the past two years. Under the extreme weight of business and cares I broke down in health, and it was only on the 15th of August that I returned to this part of the country; and since that time I have been very busy with the many points in business that were left for me to decide. I have not been able to give the questions that are propounded to me to-day the full attention that I should have done.

I desire the privilege, with the consent of the commission, of referring to my memoranda, or to some of my colleagues, that I may refresh my memory, for this reason, that I have this question for the years from 1872 to 1898 in my memory, excepting my testimony in 1888 before the Committee on Commerce in the city of Washington.

I desire to say that I hold no animosity toward the Standard Oil people or any association. They were thirty-four years my companions, and I only meet them here to-day upon fair and equitable terms. They believe in their method of doing business, and I believe in mine. We agreed to separate. Many of the stockholders of the Standard Oil Company have been associates of mine all these years in the ownership of property, and I own property with them at the present time. We simply differ on methods of transacting business. Therefore I feel that there is no one here in this room who will say I tell an untruth because I may differ from him or because of testimony that I may give in answer to questions you may ask.

Q. (By Mr. Phillips.) Where is your residence? A. Bradford, Pa.

Q. Your name in full? A. Lewis Emery, Jr.

Q. What is your occupation, and what has it been? A. My occupation for the past thirty-four years has been in the production and refining of oil.

CONNECTION WITH VARIOUS OIL COMPANIES.

Q. (By Mr. Kennedy.) I should like to ask your present connection with the independent companies —producing companies, pipe line companies, and the Pure Oil Company? A. I am connected with them.

Q. In an official connection? A. I am not an official, except that I am trustee of some stock.

Q. (By Mr. Livingston.) How do you stand in relation to all these companies? A. I am a stockholder in three of them.

Q. Which three? A. United States Pipe Line, Pure Oil Company, and the Producers' Oil Company, Limited.

Q. Any connection with the Standard? A. No; none whatever.

EARLY HISTORY OF THE OIL BUSINESS.

Q. (By Mr. Phillips.) You can proceed in your own way and make a statement to the commission as to the facts. A. The discovery of oil was in 1859, in the vicinity of the city of Titusville. The commodity was new and practically unknown to the commercial or scientific world. The oil was transported from the wells down Oil Creek, near which the first well was drilled, by teams, or by pumping the oil into boats, or, rather, at that time it was carried in buckets into flatboats made of inch lumber. These flatboats ran down Oil Creek to Oil City, Pa., and from there the oil was transferred to larger bulk boats and carried down the Allegheny River to the city of Pittsburg.

The first refineries for putting this oil into a merchantable condition were in the State of Pennsylvania, the natural and most economical place for the manufacture. The business was free and untrammeled from 1859 to 1872. The transportation by boat gave way to transportation by pipe line and by rail. The production of oil in 1865, at which time I came into the business, was about 6,000 barrels a day. In the meantime the refineries had dotted the Oil Creek valley and the Allegheny valley, and reached as far south as Cincinnati and Louisville, and as far north as Portland, Me. In 1872 we find these refineries all in active operation, north and south from the points named. From 1859 up to 1865 the oil was drawn in barrels by teams from the interior of the district, Pithole and Cherry Creek and numerous other places I could mention, each team carrying, according to the condition of the road, from three to seven barrels. A barrel of oil was about 450 pounds at that time. Then, in 1865, the pipe lines were introduced. This business was free and open to all the railroads, all the people, and all the world up to 1872. If the commission will kindly refer to this little pamphlet which I have prepared:

THE FIRST PIPE LINES.

"The first successful effort to transport oil from the well to the railroads by pipe line instead of in barrels by teams was made in 1865.

"The idea of transporting oil by a pipe to the Allegheny River originated with Thomas C. Bates, of Syracuse. A company was formed with a capital

of $100,000, Joseph Casey as president, and Thomas C. Bates as vice president. Colonel Brackett and S. M. Spencer completed the arrangements, and David Kirk was appointed superintendent. The laying of the pipe was commenced in November, 1865, and the first oil was piped on the 10th of December, 1865. From that time to January 23, 1866, the company piped 20,000 barrels of oil. The pipe was six inches in diameter, extending from Pithole to Oleopolis, a distance of seven miles, and run entirely by gravity. It had a fall of 360 feet between the field and the river. This company was known as the Pennsylvania Tubing Transportation Company.

"Another company was organized in the spring of 1865—the Rochester and Oleopolis Petroleum Company—with a capital of $100,000.

"The Miller Farm and Pithole Pipe Company commenced to lay pipe August, 1865, and completed its line in October, 1865. The length of the line was five and one-half miles. It was a two-inch line, and originally four pumps were used, but afterward only one pump was found necessary to do the work."

To give you an idea of how crude men's ideas were at this time I will mention that it was thought necessary to place a pump at the foot of each hill in order that the oil might be carried over that hill into the next valley. In a distance of five miles there were four distinct relays of pumps. It would have been held absurd to think that oil could be pumped four miles. Now we put oil into a pipe and pump it a distance of 100 to 150 miles with one stroke of the pump.

"The men who were interested in this enterprise were: M. E. Van Sycle, of Jersey City; Henry C. Ohlen, of New York; Charles Hickox and Charles W. Noble, of Cleveland, Ohio.

"The Titusville Pipe Company was organized by H. E. Pickett and G. J. Sherman, of Titusville. They commenced laying pipes in January, 1866, and completed the line in April, 1866. There were two lines of two-inch pipe from Pithole to Titusville, nine and one-fourth miles. The line cost $120,000.

"Harley & Co. line, from Benninghoff Run to Shaffer, two miles, was built in 1865.

"The Vandergrift & Forman pipe line, from Bradensburg to Oil City, in 1866.

"A charter granted in 1864 to the Western Transportation Company, from the Noble & Delemater well to Shaffer.

THE BEGINNINGS OF PIPE LINE COMBINATION.

"In 1866 the whole of the Van Sycle's line, from Miller farm to Pithole, fell into the hands of William H. Abbott and Henry Harley.

"The Avery & Hedden line, from Shamburg to the Miller farm.

"In 1867 Abbott & Harley acquired control of the Western Transportation Company. Under its charter they combined the Western and their own two lines as the Allegheny Transportation Company. The first board of directors, in 1869, were: Henry Harley, president; W. H. Abbott, secretary; Jay Gould, J. P. Harley, and Joseph Douglass; T. W. Larsen, treasurer; William Warmcastle, general superintendent.

"Harley effected a combination, reorganized the Allegheny and Commonwealth as the Pennsylvania Transportation Company, with a capital of almost $2,000,000, and 500 miles of pipe to Tidioute, Triumph, Irvineton, Oil City, Shamburg, Pleasantville, and Titusville, centering at Miller farm. Among the stockholders were Jay Gould, Thomas A. Scott, William H. Kemble, Mrs. James Fisk and George K. Anderson. This enterprise absorbed a swarm of small lines, and was considered the acme of pipe line achievement.

"The Star Pipe Line was built by Vandergrift & Forman in 1867.

"In 1871 the Commonwealth Oil and Pipe Line Company was organized in the interest of the Oil Creek Railroad.

"Under the act of 1874 of Pennsylvania, Vandergrift & Forman organized the United Pipe Lines, into which a number of lines were merged.

"I desire here to submit, as the initial acts of Pennsylvania, that eventually merged the oil business of the United States into a monopoly—the Standard Oil Trust—"

Q. (By Mr. Farquhar.) In the detailed statement you have made of the organization of these various lines, I fail to find in the case of any of these lines any of the members, the chief officers, or directors of the Standard Oil Company itself. A. We have not come to that yet.

Q. You mean to state now that the initial one of the carrier-combinations started after the United Pipe Line was formed? A. Yes; that is what I propose to show.

Q. That was in 1874? A. Oh, no; the act was of 1874; the organization was back in 1871.

Q. Was not the United Pipe Line afterwards the Commonwealth line? A. No.

Q. Are you referring to the old line of Vandergrift & Forman the year they made the junction of the oil lines in the United Pipe Lines in 1872? A. We will come to that again. I cannot answer that question until I come to it. I intended to show the consolidation of all these lines under the proper period.

THE PENNSYLVANIA RAILROAD PERMITS A PIPE LINE LAW FOR EIGHT COUNTIES TO PASS.

"The charters for oil transportation companies, granted by the legislature, were few in number and only to a favored few, the legislature steadily refusing to enact a general law. In 1872, after the exposure of the South Improvement scheme, the legislature was constrained by the popular indignation thus aroused to pass a free pipe law covering the oil producing counties—Erie, Crawford, Forest, Warren, Venango, Butler, Clarion and Armstrong. Under that law 18 lines were built from the producing districts to the railroads, the length varying from five to thirty miles."

I desire to make a remark here. In 1872, when the people of the oil field were so aroused over the report of the South Improvement Company's organization, they demanded from the legislature the repeal of the South Improvement Company's charter and the passage of the free pipe law, giving pipe line companies the right of eminent domain. Myself and many others went to Harrisburg and asked the legislature to give us such a law. We met Mr. Scott, of the Pennsylvania Railroad Company—people all-powerful in the legislative body at that time, and I do not thing their strength is in any way lessened at the present.

I asked Mr. Scott, president of the Pennsylvania Railroad, to permit this law to become general. He refused. He said that he would permit us to have a law for the eight counties named, but he would not permit us to have a law by which we could run our pipes to the city of Pittsburg. Our hope was to get a law by which we could reach competing lines of railroad and the Ohio River, so that we might transport our product by water. He said he would permit a law to pass for the eight counties named, but he would provide in the law that no pipe should go within a mile of the State line, or within a mile of any railroad but the Pennsylvania. The oil-producing people would not accept that provision in the bill. By force of circumstances, and almost a resort to arms, it was finally conceded that we should have the eight counties, but we were not permitted to have Allegheny county, that we might get to Pittsburg for the competition named. This is personal experience.

RISE OF THE MONOPOLY.

"After the adoption of the new constitution, the Wallace Corporation Act, carefully excluding from its provisions transportation of oil, was passed by the legislature, and in less than two years the old South Improvement combination, now known as the Standard Oil Trust, had, by a corrupt bargain with all the railroads, forced all but one of these lines built under the act of 1872 into bankruptcy, and, practically, sale to itself."

This is where these were consolidated—the Vandergrift & Forman, but they were forced in by the monopoly.

Q. (By Representative Livingston.) Explain what you mean by monopoly; whether the word is used advisedly or not. A. It was at that time. Perhaps I might say the word monopoly there would be a little premature, because it had not accomplished all its plans to get absolute control of the business.

Q. (By Mr. Kennedy.) Has it ever had absolute control of the business? A. Absolutely so.

Q. Competition wiped out entirely? A. Entirely so; there was a time when I did not know of a living independent refiner.

Q. (By Representative Livingston.) The word monopoly means the Standard? A. It does.

Q. We would rather hereafter you would say the Standard Oil Company. A. It will not suit when I get a little further along.

Q. There are so many monopolies that I do not know which you are speaking of.

Q. (By Mr. Kennedy.) Is there any monopoly now? A. If you will allow me to go on, I will get to these things; there will come a time when you can shoot all the shot at me you want to; but to answer that question would be a little premature until you have heard all my argument.

Q. I withdraw that question.

"The old oil fields are now entirely at the mercy of the monopoly; and upon the development of the new Bradford district, the monopoly through its transportation—the United Pipe Lines and the American Transfer Company—took possession of that field also. Since 1876 the whole oil district, covering nine counties (and with the Pennsylvania Railroad or one of its branches within from one to twenty miles of every well), has been under the complete dictation of this trust. A brief statement of the history of this trust, its methods and policy, its influence upon the crude and refining industries and upon the oil regions generally, together with certain inferences to be drawn therefrom, may enable the commission to form some estimate of its future, and possibly to suggest some relief from its baneful influence. Twenty-nine years ago the Standard Oil Company was a corporation located at Cleveland, Ohio, with a capital of less than a million dollars."

SIZE OF THE STANDARD OIL COMPANY IN 1870.

Now I wish to digress; I wish to show the holdings of the Standard Oil Company. I propose to give the commission the testimony of Mr. Flagler, which I heard at the time, and which is of record in this book. The book is the report of the investigation of the sugar trust and the Standard Oil Trust by the Committee on Manufactures of the House of Representatives in 1888. (House Reports, Fiftieth Congress, first session, vol. 9.

Mr. Gowen asks the question (p. 288):

"Were you a stockholder of the Standard Oil Company of Ohio, as well as an officer? A. Yes, sir.

"Q. From what time? When did you first become such? A. From its organization.

"Q. In what year was that? A. I think early in 1870.

Q. Were you not connected in any manner with the oil trade or with associations or corporations interested in or connected with the oil trade prior to the formation of the Standard Oil Company of Ohio? A. I was a member of the firm of Rockefeller, Andrews & Flagler.

"Q. Where was it located? A. Cleveland, Ohio.

"Q. What was their business? A. Refining oil.

"Q. That was a private partnership, was it not? A. Yes, sir.

"Q. Did it engage directly in the business of refining? A. Yes, sir.

"Q. Did that firm erect refining works, or did they buy them from some one else? A. They bought

works from two firms, one of whch, I believe, was Rockefeller & Co. and the other Rockefeller & Andrews. They succeeded those two firms.

"Q. Were you interested in either before you became a member of the new firm? A. I was not.

"Q. Were you in business with them or connected with them in any way? A. I was not.

"Q. When your own firm came into existence, or after it had gone into business, what was the extent of its refining capacity? A. As well as I can recollect, 600 barrels a day of crude oil.

"Q. Your firm practically, therefore, formed the Standard Oil Company of Ohio and turned its works over to that company? A. Yes, sir.

"Q. And accepted stock in that company in consideration of its theretofore private ownership in the firm? A. Yes, sir.

"Q. What was the capital of the Standard Oil Company of Ohio? A. One million dollars."

That is as far as I need go; and I want this commission to bear in mind now that the Standard Oil Company of Ohio owned, in 1870 and 1871, 600 barrels refining capacity. I will call your attention later on to their ownership in 1879, in testimony before the Hepburn committee, which was appointed by the New York State legislature. I will leave that part of the subject for the present.

RAILROAD MAGNATES BECOME STOCKHOLDERS IN THE STANDARD.

Soon after this it was reorganized, when Scott, of the Pennsylvania Railroad; Vanderbilt, of the New York Central Railroad; Jewett, of the Erie Railroad; Watson, of the Lake Shore Railroad, and other railroad managers became interested in it as large stockholders. With the influence thus gained it attempted the establishment of the South Improvement Company. This attempt failed.

Just there I desire to call your attention, on page 6 of this pamphlet, to the incorporation of the South Improvement Company.

CHARTER OF THE SOUTH IMPROVEMENT COMPANY.

An Act to incorporate the South Improvement Company.

Section 1. Be it enacted by the senate and house of representatives of the Commonwealth of Pennsylvania in general assembly met, and it is hereby enacted by the authority of the same, That S. S. Moon, R. D. Barclay, John A. Fowler, or a majority of them, their associates, successors, and assigns, be, and they are hereby, authorized and empowered to form and be a body corporate, to be known as the South Improvement Company, which shall be, and is hereby, vested with all the powers, privileges, duties, and obligations conferred upon the act to corporate the Pennsylvania Company, by the act of the legislature of Pennsylvania, approved the 7th day of April, A. D. 1870, and the supplement thereto.

Sec. 2. That the stockholders of said company, by and with the consent of the holders of not less than two-thirds of the shares of stock, be, and they are hereby, authorized to change the name and title of the said company and designate the location of its general office, which changes shall be valid after the filing of a certificate in the office of the secretary of the Commonwealth, signed by the president and attested by the seal of the said company.

JAMES H. WEBB,
Speaker of the House of Representatives.

WILLIAM A. WALLACE,
Speaker of the Senate.

Approved the 6th day of May, A. D. 1871.
Jno. W. Geary.

CHARTER OF THE PENNSYLVANIA COMPANY.

I desire to have this act read, because I was asked this morning by one of the commissioners what power they had under the South Improvement Company charter. I should like to reply to that question before the commission, if I dare, what a very eminent judge said in our section of the country relative to the powers of this company, but as it is not perhaps preliminary, I will tell the story afterwards. I desire to have Senator Lee read this incorporating act. I do that because I wish this commission to hear the unparalleled privileges granted under the charter and why they sought it; and I desire to follow this along and show you that years after that time they acquired the same charter under a different head. Charters were for sale. They were manufactured by the legislature of the State of Pennsylvania for that purpose. I know; I have spent seventeen years of my life there.

AN ACT TO INCORPORATE THE PENNSYLVANIA COMPANY.

Section 1. Be it enacted by the senate and house of representatives of the Commonwealth of Pennsylvania in general assembly met, and it is hereby enacted by the authority of the same, That Andrew Howard, J. S. Swartz, G. B. Edward, J. D. Wellsto, and J. T. Malin, their associates, successors, and assigns, or a majority of them, be, and they are hereby, authorized to form and be a body corporate, to be known as the Pennsylvania Company, and by that name, style, and title shall have perpetual succesion and all the privileges, franchises and immunities incident to a corporation; may sue and be sued, implead and be impleaded, complain and defend in all courts of law and equity, of record and otherwise; may purchase, receive, hold and enjoy, to them, their successors, and assigns, all such lands, tenements and leaseholds, estates and hereditaments, goods and chattels, securities and estates, real, personal and mixed, of what kind and quality soever, as may be necessary to erect depots, engine houses, tracks, shops, and other purposes of said corporation, as hereafter defined by the second section of his act; and the same from time to time may

sell, convey, mortgage, encumber, charge, pledge, grant, lease, sublease, alien and dispose of, and also make and have a common seal, and the same to alter and renew at pleasure, and ordain, establish and put in execution such by-laws or ordinances, rules and regulations as may be necessary or convenient for the government of the said corporation, not being contrary to the constitution and laws of this Commonwealth, and generally may do all and singular the matters and things which to them shall appertain to do for the well being of the said corporation and the management and ordering of the affairs and business of the same: Provided, That nothing herein contained shall be so construed as to give to the said corporation any banking privileges or franchises or the privilege of issuing their obligations as money.

Sec. 2. That the corporation hereby created shall have power to contract with any person or persons, firms, corporations, or any other party, howsoever formed, existing, or that may hereafter exist, in any way that said parties or any of them may have authority to do, to build, construct, maintain, or manage any work or works, public or private, which may tend or be designed to include, increase, facilitate, or develop trade, travel, or the transportation or conveyance of freight, live stock, passengers, or any other traffic, by land or water, from or to any part of the United States or the territories thereof; and the said company shall also have power and authority to supply or furnish all needful material, labor, implements, instruments and fixtures of any and every kind whatsoever on such terms and conditions as may be agreed upon between the parties, respectively, and also to purchase, erect, construct, maintain, or conduct, in its own name and for its own benefit, or otherwise, any such work, public or private, as they may by law be authorized to do (including also herein lines for telegraphic communication), and to aid, co-operate and unite with any company, person, or firm in so doing.

Sec. 3. The company hereby created shall also have the power to make purchases and sales of or investments in the bonds and securities of other companies, and to make advances of money and of credit to other companies, and to aid in like manner contractors and manufacturers, and to receive and hold, on deposit or as collateral or otherwise, and estate or property, real or personal, including the notes, obligations, and accounts of individuals and companies, and the same to purchase, collect, adjust, and settle, and also pledge, sell, and dispose thereof on such terms as may be agreed on between them and the parties contracting with them; and also to indorse and guarantee the payment of the bonds and the performance of the obligations of other corporations, firms, and individuals, and to assume, become responsible for, execute and carry out any contracts, leases or subleases made by any company or companies, individuals or firms whatsoever.

Sec. 4. The company hereby created shall also have power to enter upon and occupy the lands of individuals or of companies on making payment therefor or giving security according to law for the purpose of erecting, constructing, maintaining or managing any public work, such as is provided for or mentioned in the second section of this act, and to construct and erect such works thereon, and also such buildings, improvements, structures, roads or fixtures as may be necessary or convenient for the purposes of said company under the powers herein granted; and to purchase, make, use and maintain any works or improvements connected or intended to be connected with the works of said company; and to merge or consolidate or unite with the said company the improvements, property, and franchises of any other company or companies on such terms and conditions as the said company may agree upon; and to fix and regulate the tolls or charges to be charged or demanded for any freight, property, or passengers traveling or passing over any improvement erected, managed or owned by the said company, or on any merchandise or property transported over any road whatever by the said company, and to make from time to time, dividends from the profits made by the said company; the several roads managed by said company shall continue taxable, as heretofore, in proportion to their length within this state, respectively; and the said Pennsylvania Company shall be taxable only on the proportion of dividends on its capital stock and upon net earnings or income, only in proportion to the amount actually carried by it within the State of Pennsylvania, and on its earnings or income derived from its business beyond the limits of this commonwealth and shall not be liable for taxation.

HOW THE NATIONAL TRANSIT COMPANY (STANDARD) GOT THE SAME CORPORATE POWERS WHICH THE SOUTH IMPROVEMENT COMPANY WERE GRANTED.

I simply wanted the commission to understand the powers given under this incorporation. I desire to call your attention, incidentally, now to page 15½ of this pamphlet: "When the popular excitement raised against the South Improvement Company, which resulted in the repeal of the act to incorporate it, had subsided, the trust for the purpose of its transportation business in Pennsylvania, secured a franchise substantially as follows:

"An act to incorporate the Overland Contract Company was approved March 22, 1871."

That is the act for transporting oil by pipe line throughout the State of Pennsylvania; and the provisions of the Southern Railway Security act, or the Overland Contract Company act, are the same as the Pennsylvania Company, or the South Improvement Company act identically. It is simply the same act with another head.

Q. The one you read, incorporating the Pennsylvania Company? A. Yes. What I mean to say is that this act read by Senator Lee is the identical act under which the National Transit Company is organized and from which they get all their privileges; and there is nothing not set forth in that act.

Q. Do they get their powers and privileges from this old corporation without having to go to the secre-

tary of state for any charter? A. The National Transit Company people bought this charter under which the National Transit Company is organized on March 8, 1881, for $16,250. The provisions of that law are just the same as the provisions of the South Improvement company act—one and the same, in every word, letter and line.

Q. (By Mr. Farquhar.) How long was the South Improvement Company in existence? A. About three months.

Q. And immediately after, the other company was organized with the same rights and privileges, but not the same title. How did they come to get the privilege when they applied? A. It is another company.

Q. And contemporaneous? A. No; in 1881.

Q. When was the South Improvement Company act repealed? A. March 25, 1872.

Q. Then how was it possible for another company, except by an entire re-enactment, to take all the privileges of the South Improvement Company? A. The body of the South Improvement Company act is just the same as the body of the Southern Railway Security Company act. As I have said, there were 12 or 15 other charters of the same character, with the same body.

THE OIL BUSINESS WAS FREE TO ALL AT FIRST.

Now, from 1872, of which I have given you a history, up to the purchase of this charter in 1881, I will endeavor to show you what relation the South Improvement Company have had to the Standard Oil Company; and I come simply now to the South Improvement Company charter. I must travel along to 1874 before I can give you the connection. I have occasion, however, to refer to this; but bear in mind you are speaking of the Standard Oil Company, and perhaps I may be speaking of the National Transit Company, which is one of the lines of the Standard Oil Company of Pennsylvania. I desire you to understand this franchise carried with it all the powers and privileges exercised by the South Improvement Company, of unlimited capital and power.

Q. The question is, did other companies of Pennsylvania have just as good privileges at that time? A. No; the business was in everybody's hands at this time. It was just as free for you to go into the oil business and transport your oil down the Allegheny River and on the railroads as for you to go and fish in the Potomac. You could put your money into a well or pipe line, or anything you wanted to. It was absolutely free and open to everybody. There were no encroachments, no hampering at that time.

Q. Was there any attempt on the part of any of the other refiners and producers to get a charter of equal privileges with this South Improvement Company? A. Not to my knowledge.

Q. From 1872 to 1881? A. I do not know about that.

DRAWBACKS AND REBATES MADE THE TROUBLE.

Q. Was it the lack of taking advantage of combination at that time that handicapped the parties who did not combine as these parties had? A. A man was at that time, I believe, and undoubtedly is at this, disposed to obey the laws of the country. The old constitution of the state of Pennsylvania, the new, and I think every other constitution of any of the states of the Union prohibited undue discrimination. It was against the law.

The whole difficulty arising today is due to the discriminating rates. The railroads of this country are responsible today for the existence of these trusts, because they gave the favored shippers such drawbacks and rebates that finally the Standard Oil Company, with its privileges, drove the entire oil industry into its own hands. I do not say for a moment but that these people had the right to do this if they wanted to, but I do say that when they did do it they were violators of the common law, and that I would not connect myself with them on that ground. I was an original. I was there; I had my refineries; I built my pipe line in 1868 and in 1870, long before I knew anything of these people. I did not see fit to place my fortunes in their hands. Dollars and cents—yes; it would have been millions to me if I had, but I did not feel that I could surrender my principles under the arrangement, or the law, set forth under the South Improvement Company. But the most damnable thing that followed was the contract. While it has been given in evidence upon this floor that the Standard Oil Company are not responsible for the acts of the South Improvement Company, but the contract that followed—that was framed in Cleveland and brought to the Pennsylvania Railroad and they accepted it, and the contract was signed by J. Edgar Thompson, president of the road at that time.

Q. Were not all the railroads wildcatting at that time, anyway? A. No, sir. I do not doubt but railroads were giving discriminating rates; I have expressed myself firmly upon that question. You know it—as a business man, you know it; and I will show you before I leave this floor that discriminations have been made right up almost to the present time.

THE CONTRACT BETWEEN THE SOUTH IMPROVEMENT COMPANY AND THE PENNSYLVANIA RAILROAD COMPANY.

Now I desire to call your attention to the contract between the South Improvement Company and the Pennsylvania Railroad, dated January 18, 1872, and I propose to show you before I quit that this contract went into existence absolutely and was signed by the president, although it has been denied upon this stand that it ever went into operation.

Q. (By Representative Livingston.) For what purpose? A. It is to show you the contract that was made between the Pennsylvania Railroad and the South Improvement Company.

Q. Is that a verified statement you read? A. I will read the contract itself, signed by the Pennsylvania Railroad.

Q. That is a verified copy, is it? A. Oh, it is in the investigation of 1871, and it is all in the congressional report of 1888, and the Hepburn committee's proceedings, and in all the investigations that have

been going on. It seems to me that investigations don't amount to a cent. It is printed; in all the libraries of the United States it can be had, or in any town library—the history of this very business I am relating. [See Fiftieth Congress, first session, House Reports, vol. 9, pp. 357.]

"Agreement made and entered into this 18th day of January, in the year 1872, by and between the South Improvement Company, a corporation organized and existing under the laws of the state of Pennsylvania, party hereto of the first part, and the Pennsylvania Railroad Company, on its own behalf and on behalf of all other railroad companies whose roads are controlled, owned or leased by it, or with which it has sufficient running arrangements, which other roads are herein described as the connections of the said Pennsylvania Railroad Company, party hereto of the second part, witnesseth:

"Whereas, the party hereto of the first part has been organized for the purpose, among other things, of increasing, facilitating and developing the trade in and the conveyance and transportation of petroleum and its products, and for that purpose proposes, among other things, to expend large sums of money in the purchase, erection and construction of, and maintaining and conducting works for storage, distillation and refining, warehousing and transportation and in various other ways, upon the inducement, among other things, of this contract;

"And whereas, the magnitude and extent of the business and operations proposed to be carried on by the party hereto of the first part will greatly promote the interest of the party hereto of the second part, and make it desirable for it by fixing certain rates of freight, drawbacks and rebates, and by the other provisions of this agreement, to encourage the outlay proposed by the party hereto of the first part, and to facilitate and increase the transportation to be received from it.

DIVISION OF PETROLEUM TRAFFIC.

"And whereas it has been agreed by and between the party hereto of the second part, for itself and its connections, the Erie Railroad Company, for itself and its connections, and the New York Central Railroad Company, for itself and connections, that the business of transporting by railroad crude petroleum and its products toward the Atlantic coast, from the points of production and refining on their lines of road, shall be allotted by the party hereto of the first part to the said three companies in the proportion of 45 per cent of the whole to the Pennsylvania Railroad Company, for itself and its connections, including the Philadelphia and Erie Railway, the Northern Central Railway, the Allegheny Valley Railroad, Camden and Amboy Railway, the Pennsylvania Company, and all other railroads which are or may be controlled, owned and leased by it or with which it has or may have sufficient running arrangements; 27½ per cent of the whole to the Erie Railway Company for itself and its connections; and 27½ per cent of the whole to the New York Central Railroad Company, for itself and its connections, and that the transportation beyond Cleveland and Pittsburg over the railroads of the said companies and their connections, in other directions than toward the Atlantic coast, west from said points of production and refining, shall be allotted by the party hereto of the first part in the proportion of one-third thereof to the party hereto of the second part, for itself and its western connections, and the remainder to other railroads."

That means this: That all oil going to the Atlantic coast shall be divided as set forth, 27½ per cent. to the Erie, 27½ per cent. to the New York Central, and 45 per cent. to the Pennsylvania, leaving the balance of trade, which was apportioned to be about 10 per cent. to the western country, and it should be divided between three roads. Do you understand? That is to say, the 10 per cent. going to the west for the western consumption, the rebate agreed by the railroads to pay to be upon the same basis, and shall be divided third and third, the Pennsylvania Railroad paying into the hands of the South Improvement Company 27½ per cent., etc. That is the division.

"Now, therefore, this agreement witnesseth, that the parties hereto, for themselves and their successors, in consideration of the premises, of the mutual execution hereof, and of the mutual advantages hereby conferred, have covenanted and agreed, and do hereby covenant and agree, each with the other, as follows:

"ARTICLE FIRST.

"The party hereto of the first part covenants and agrees:

"1. To furnish to the party hereto of the second part, for transportation, such a proportion of the crude petroleum and its products owned or controlled by the party hereto of the first part as shall give to the party hereto of the second part 45 per cent of all the crude petroleum and its products sent from the points of production and refining toward the Atlantic coast by the said Pennsylvania, the Erie and the New York Central railroads and their connections, and 33 1-3 per cent of that which is sent west of Pittsburg and Cleveland by those railroads and their connections.

"2. To provide suitable tankage at the points where petroleum is produced on the railroads of the party hereto of the second part and its connections in which to receive crude petroleum preparatory to shipment, with the necessary pipes, pumps, racks and other appliances for its convenient transfer in bulk into railroad cars.

"3. To deliver to the railroads of the party hereto of the second part and its connections at the places of shipment and to receive from them at the places of destination all crude petroleum and its products transported over their railroads for the party of the first part.

"4. To provide at the places of destination on the seaboard necessary and suitable yards, wharves, warehouses, sheds, tanks, pipes, pumps, and motive power for the reception of petroleum and its products and loading vessels therewith."

I want you to follow this contract right there. I propose to show you that this contract has, in fact, been carried out to the letter from the day of its in-

ception, in spite of the repeal of the South Improvement Company charter.

"5. To provide, maintain and operate the works necessary to refine crude petroleum upon the largest scale practicable, and with such skill and on such a system of organization and division of labor as will secure both efficiency and economy; and for that purpose, and for the purpose of developing and increasing the petroleum trade of the country, to provide and maintain all suitable and necessary means and facilities.

RECORDS OF THE TRANSPORTATION OF ALL PETROLEUM AND ITS PRODUCTS.

"6. To keep records of the transportation over the railroads of the party hereto of the second part, and its connections, and, so far as it can obtain the same, over the Erie and the New York Central railroads and their connections, of all petroleum and its products."

That they may ship under this contract—bear that in mind—of all petroleum and its products.

"Showing the number of barrels of 45 gallons each in bulk and the number of barrels of 47 gallons in barrels carried by each road, with the points of receiving and delivery and the amount of freight received by each road, for such transportation, which records shall at all reasonable times be open to the inspection of the duly constituted representatives of the party hereto of the second part."

That is to say, the railroads are open, absolutely, to the inspection of this company; that they had the right to go in at any time and take down from the place of deposit those books and look over them and see that which I ship or anybody else ships.

"Monthly abstracts of all such records shall be regularly sent to the party of the second part."

See how complete. That an abstract of those books must be sent to the office of this company that they may look into the business of Governor Harris, Mr. Phillips, or Mr. Farquhar—anybody, it does not matter whom. That was the power given; and I simply say, if you will take the evidence of the investigation of 1871 and 1872, take the investigations of the Hepburn committee, take the investigations of the state of Pennsylvania, and every scintilla of evidence produced, and you will find that this contract has been carried out to the letter, even up to the present time. There is no secrecy in my business today. My business is known every 24 hours, just exactly what I do. I make that assertion because I can produce the evidence.

Q. (By Mr. Farquhar.) Possibly these parties entering into contracts with the railroads are a little afraid of the railroads themselves cheating? A. That might be so.

"7. To pay the party of the second part weekly for all transportation over its roads and its connections of petroleum and its products such gross rates and half rates of freight as are hereinafter specified, less the rebates and drawbacks hereinafter provided to be retained by the party hereto of the first part for its own use.

REBATES AND DRAWBACKS TO THE SOUTH IMPROVEMENT COMPANY ON ALL OIL SHIPPED BY IT OR OTHER COMPANIES.

"ARTICLE SECOND.

"The party hereto of the second part covenants and agrees:

"1. That the party hereto of the second part will pay and allow to the party hereto of the first part for its own use, on all petroleum and its products transported over the railroads of the party hereto of the second part and its connections, for the party hereto of the first part, rebates, and on all transported for others drawbacks, at the rates hereinafter provided, except in the case specified in article third."

Not only what they ship themselves, but what every individual shipped; whatever oil was shipped at that time..

"2. To deliver to the party hereto of the first part, for all petroleum and its products in packages, transported over the railroad of the party hereto of the second part and its connections, by whomsoever shipped, and consigned to the party of the first part, at the warehouses of the party of the first part, at the seaboard and inland, at the depots of the party of the second part, at the places of destination, and to deliver all petroleum and its products, in bulk, owned by or consigned to the said party of the first part, at any point required on the line of the railroads of the party of the second part and its connections.

OPEN RATES.

"3. To transport and deliver petroleum and its products over the railroads of the party of the second part, and its connections, at gross rates, which shall at no time exceed the following, without the consent of both parties hereto:

"From any point on the Oil Creek and Allegheny River railroad to Oil City, Union, Corry, Irvineton, which are herein designated as 'common points,' on each barrel of 45 gallons in bulk and on each barrel of 47 gallons in barrels, 30 cents.

"On Crude Petroleum.

From any common point (for each barrel of 45 gallons) to—

Cleveland	$0.80
Pitttsburg	.80
New York	2.56
Philadelphia	2.41
Baltimore	2.41
Boston	2.71

"All other points except those on the Oil Creek and Allegheny River railway to the places of destination last named the same rates as from the common points."

"On Refined Oil, Benzine and Other Products of the Manufacture of Petroleum.

From Pittsburg (for each barrel) to—	
New York	$2.00
Philadelphia	1.85
Baltimore	1.85
From Cleveland (for each barrel) to—	
Boston	$2.15
New York	2.00
Philadelphia	1.85
Baltimore	1.85
From any common point (for each barrel) to—	
New York	$2.92
Philadelphia	2.77
Baltimore	2.77
Boston	3.07

"From and to all points intermediate between the points aforesaid, such reasonable rates as the party of the second part shall from time to time establish on both crude and refined.

"From Pittsburg, Cleveland and other places west of Pittsburg and Cleveland, such reasonable rates as the party of the second part may deem it expedient from time to time establish.

REBATES AND DRAWBACKS.

"4. To pay and allow to the party hereto of the first part on all petroleum and its products transported for it over the railroads of the party of the second part and its connections the following rebates, and on all transported for other parties drawbacks of like amounts as the rebates from the gross rates, the same to be deducted and retained by the party hereto of the first part for its own use from the amounts of freights, payable to the party of the second part.

"On the Transportation of Crude Petroleum.

[Rebate Per Barrel.]

From the gross rate from any common point to—	
Cleveland	$0.40
Pittsburg	.40
New York	1.06
Philadelphia	1.06
Baltimore	1.06
Boston	1.06

"From the gross rate from all other points and the six places of destination last named rebates the same as on the rates from the common points.

"On the Transportation of Refined Oil, Benzine and Other Products of the Manufacture of Petroleum.

From the gross rates from Pittsburg to—	
New York	$0.50
Philadelphia	.50
Baltimore	.50
From the gross rates from Cleveland to—	
Boston	$0.50
New York	.50
Philadelphia	.50
Baltimore	.50
From the gross rates from any common point to—	
New York	$1.32
Philadelphia	1.32
Baltimore	1.32
Boston	1.32

Now I will refer to page 43.

"From the gross rates to and from all points intermediate between the above points a rebate or drawback of one-third of the gross rate shall be paid.

"From the gross rates from Pittsburg, Cleveland and other points to places west of the meridians of Pittsburg and Cleveland a rebate or drawback of one-third of the gross rates shall be paid.

TO CHARGE ALL OTHER PARTIES NOT LESS THAN THE GROSS RATES ABOVE.

"5. To charge to all other parties (excepting such as are referred to in article 3) for the transportation of petroleum and its products rates which shall not be less than the gross rates above specified, and should at any time any less rate be charged, directly or indirectly, either by way of rebate, commission, allowances or upon any pretext whatsoever, the same reduction per barrel shall be made to the party hereto of the first part from the net rates provided for them on all transportation for them during the period for which such reduction shall be made to others.

"6. To permit the party hereto of the first part, if in its judgment the currents of trade should so require, temporarily to increase or diminish the proportion, as herein provided, to the party hereto of the second part, for itself and its connections, as the whole business of transporting petroleum and its products, as between the party hereto of the second part, the Erie Railway Company and the New York Central Railroad Company. The party of the second part in such case to receive from the party hereto of the first part, in full payment or indemnity for the excess or deficiency, one-half the net schedule rates on such excess or deficiency, the other half to be paid pro rata to the said other companies whose apportioned quantity of transportation shall thus be varied; but such diversion of business shall not at any time exceed one week, nor be repeated without an interval of at least 60 days"—

That provision means that if it became necessary in order to crush out any particular individual they had the right to exercise the privileges of clause six; but it should not be done for more than one week in each interval of 60 days.

"Unless with the consent of the party hereto of the second part. Also that whenever, from time to time, as aforesaid, a temporary diversion of a part of the apportioned transportation of the party of the second part to the other railroads aforesaid, or to either of them, shall become necessary, cars of the party of the second part may be loaded by the party of the first part and sent away over such other railroads, or either

of them, but the cars so sent away shall be returned without unnecessary delay and in as good order as when taken, to the railroads of the party of the second part, and mileage at the usual rates paid for their use while absent.

"7. To furnish with as much regularity as possible at all times good and sufficient cars and other means suitable and necessary for the safe and prompt transportation of all crude petroleum and its products, either bulk or in barrels, which the party hereto of the first part shall desire to send from one point to another (and which shall be supplied with as much regularity as possible) on or over the railroads of the party of the second part and its connections.

ALL DETAILS OF SHIPMENTS TO BE REPORTED TO THE SOUTH IMPROVEMENT COMPANY.

"8. To make manifests or waybills of all petroleum or its products transported over any portion of the railroads of the party of the second part or its connections, which manifests shall state the name of the consignor, the place of shipment, the kind and actual quantity of the article shipped, the name of the consignee and the place of destination, with the rate and gross amount of freight and charges, and to send daily to the principal office of the party of the first part duplicates of all such manifests or waybills."

Now, do you understand that? Sending in waybills and everything connected with that shipment. The name of the shipper even must be in that report.

SUCH REPORTS STILL MADE TO THE STANDARD.

Just here I want to give you a sample. I want to state from personal experience the carrying out of that contract within a brief space of time. It grew out of this: I shipped a car load of oil. I will not call the name of the road. I shipped a car load of lubricating and refined oil—that is to say, a mixed car—from Bradford, Pa., where my little refinery is located, to Dubois, which was a station down in the coal country, in Elk county.

Q. (By Mr. Clarke.) When was this? A. A little less than a year ago. I loaded this oil and there was a gentleman who owned a sawmill in that section, and who had been an old acquaintance of mine for thirty-odd years; he was an employe of the road and is upon the road today. He runs the fast passenger train upon that road. He says: "I want two barrels of oil sent down to my mill." I put those two barrels of oil on top of a car load of stuff. I took the precaution not to put the oil in that car until after business hours. The car was sealed by the officer of the road. It was to have left the yard the next day, but through some mistake it did not leave. The engineer got off his engine and without taking off his overalls, he came up Main street to my office, and he said: "Who in the devil is giving away your business?" I said: "What's the matter?" Said he: "When I got off my engine at Dubois, ——— said" calling the engineer by name): "You are buying oil from Emery. I was advised this morning by the agent at Dubois that I had been derelict in my duty in not selling you that oil—in permitting Emery to sell it. I am threatened with discharge." The gentleman turned around to him and said: "How the hell do you know I bought any oil from them; and if I have, what business is it of yours?" He left. Now, I swear that that oil was put in that car on the top of those barrels without a single man's knowing anything about it excepting the man who put it in and my son, who has charge of the business. I say again that is only one instance of the carrying out of this part of this section I have read. I have no doubt, and I know in my own mind, that my business is followed to this day under the provisions of that section, the same as it was in 1872. I speak not for any one else, except as I speak of the evidence as set forth in 1871 and 1880. Those cases are numerous. It is not the only instance. I could give you a hundred others if necessary and the time could be taken, and I say that although the charter of the South Improvement Company was repealed and the provisions of this contract were annulled, they have been constantly carried out and are, in my opinion, being carried out at this very moment.

Now I am coming to the most interesting article of all in this contract, and I call your particular attention to it:

EQUAL OPPORTUNITIES TO "ANY OTHER PARTY WHO SHALL FURNISH AN EQUAL AMOUNT OF TRANSPORTATION.

"ARTICLE THIRD.

"And it is hereby further covenanted and agreed by and between the parties hereto that the rebates hereinbefore provided for the party hereto of the first part may be made to any other party who shall furnish an equal amount of transportation and who shall possess and use works, means and facilities for carrying on and promoting the petroleum trade equal to those possessed and used by the party hereto of the first part."

I desire to have questions asked upon that point. It has been claimed that anybody—yes, everybody—could enter the oil business. It is true, but they must enter the business as set forth in the articles on pages 44 and 45 of my pamphlet.

"And it is hereby"— I am reading article fourth.

Q. (By Mr. Kennedy.) Why not give it to us, Senator? A. It is a question that has been denied upon the stand time and time again.

Q. (By Mr. Farquhar.) The statement was made on this stand that the Standard Oil Company enjoyed no other or greater privileges than were enjoyed by any other company? A. That is true under that section. Now, here is a contract that provides for the shipment of petroleum, all of it, at that time; or rather, had the provisions of the contract been carried out as set forth in the charter, as well as in the articles of agreement, how in the world could anybody else have that which they possessed themselves—all the oil, all the rebates and all the transporation? Would it have been possible for you to go into the business and possess an equal amount of oil, equal facilities, equal refineries, unless you had behind you a railroad company

as strong as the railroad combination itself? It was impossible, absolutely impossible, for any set of men to go out and get equal contracts, because they had got all of the roads then leading to the Atlantic coast and into the western country. There was no chance whatever for a man with a single pipe line. I was a manufacturer. I had my refinery at that time. I did not have equal facilities, and I could not get them. I was one of the hundreds that went to the wall under that contract, although it is said by witnesses and everybody else that it was repealed and went out of existence. You know, gentlemen, as well as I when the fading of the business commenced. It faded from 1872, and it went out of existence in 1877, although the contract was repealed; and I may say right here that the Standard Oil Company was organized in Cleveland, Ohio, and later on, in 1872, it, with the Pennsylvania railroad, the New York Central, the New York and Erie, became partners in that arrangement, in that contract itself. How in the world could I get equal facilities when all the railroads were in that combination? It was a moral impossibility; nobody had an equal show. Is that an answer?

THE WITNESS PAID THE OPEN OR GROSS RATES.

Q. Well, a little further. Can you give testimony to this commission as to the rates which you paid there at that time? A. At which time?

Q. At the time mentioned here. How much more did you pay, or did you pay the open rate? A. We paid the open rate. Although you see it did not go into existence, I can produce you bills showing that I was charged $2.06 from my refinery on this oil. I say it did go into active operation in so far as freight was concerned.

Q. Have you before now or at any time produced any of these bills? A. No.

Q. Have they ever asked you? A. No; and I want to say this, that the bills at that time—now, I may be a little too fast in saying I can obtain them. We paid the open rate of freight, whatever it was at the time. That is what I say, and we went out of business in the latter part of 1873; we were compelled to go out. But what I am dwelling upon is the fact that it was laid open to the people of the country at that time. I went to Mr. Cassatt and made my complaint and said, "I can not do business." He said to me personally, "If you will give me the same amount of freight that the Standard Oil Company do we will transport goods at the same price."

Q. Did they ever make a proposition for you to transport all your oil over their lines? A. Not at that time.

Q. Did they ever? A. I went into business the second time at the instance of the Pennsylvania Railroad, and they then drove me to the wall a second time.

"AGAINST LOSS OR INJURY BY COMPETITION."

Now I will read article four:

"And it is hereby further covenanted and agreed by and between the parties hereto that the party hereto of the second part shall at all times co-operate, as far as it legally may, with the party hereto of the first part, to maintain the business of the party hereto of the first part against loss or injury by competition"—

By competition! Think of it! Didn't care anything about the other fellow!

"To the end that the party hereto of the first part may keep up a remunerative, and so a full and regular business, and to that end shall lower or raise the gross rates of transportation over its railroads and connections, as far as it legally may, for such times and to such extent as may be necessary to overcome such competition. The rebates and drawbacks to the party of the first part to be varied *pari passu* with the gross rates."

Practiced to this day. That provision is being carried out, and I desire to be questioned on that point. Any one in this land of ours, supposed to be a land of liberty and of free trade, excepting the tariff part of it—that system extends to Germany and foreign countries generally.

UNFAIR TRADING PREVENTED IN GERMANY—INDEPENDENTS CAN DO BUSINESS THERE.

Q. (By Mr. Kennedy.) Right there, Senator, some of your business associates have testified before the commission that at the present time in Germany you are on an equality with the Standard Oil Company? A. Thanks to the government of Germany we are, so far as our business goes, because Germany by law prohibits unfair trading and owns every mile of railroad in the great empire excepting two in the south, and no such thing as discrimination is known. They go further. They invite you to come to the Reichstag and make complaint, or to its officers, and I did in 1895. Oil was selling on the Rhine at 1½ to 2 cents a gallon below the price on the Elbe. Our agent, who was afterwards purchased, was in a grievous situation, and we are putting up oil here and sending it to Europe practically for nothing. I have sold oil at my works to take care of that trade, competing with the Standard Oil Company, or the Deutsche-Americanische Company, as low as a cent a gallon—losing twenty, twenty-five or thirty thousand dollars on a cargo of oil to maintain our agency in that country. Complaint was made by our agent, Mr. Poth. He handled at that time from four to six hundred thousand barrels. I traveled with him to Berlin and went personally before the entire ministry of that country, and in English I presented the case, and he interpreted my testimony to them and asked for help. We have been praying here from 1872 to this time, by the investigations of 1871, 1888, and the State of Ohio, and every State of the Union where these people are known. We have sued for it in every legislature of the country. Texas has waked up and she says: "Get out; we won't have you." The Reichstag of that country gave notice that there must be no unfair trading in that country.

Q. (By Mr. Clarke.) No what? A. No unfair trading. It must be on a fair, competitive basis. If it deviated from that, investigation would follow. No levying of tribute upon the Elbe citizens and advantages given to the Rhine. Prices were the same to all.

Q. How did they give that notice? A. I can not tell you.

Q. How do you know they did give notice? A. I beg your pardon. I do not know that there was notice given.

Q. You do not know of any legislation on the subject. A. Oh, no, I do not; but I understand, Mr. Clarke, that there is a law in Germany prohibiting unfair trading. I never read it.

Q. Can you tell me if there have been steps taken to obtain such information? A. Now, I do not know but there has. I do not know this, however, and I read the bill. There was a bill introduced into the Reichstag which was applicable entirely to the question of petroleum. It was considered and came up, but never has passed, to my knowledge. There may have been something passed since that time, however. But suffice it to say we find the markets of Europe on even tenure, and we are in competition, as Mr. Kennedy stated.

THE DEUTSCHE-AMERIKANISCHE COMPANY BOUGHT OUT AGENT OF THE INDEPENDENTS.

But when I went there in 1896, the Standard Oil Company, the Deutsche-Amerikanische Company, had bought the last vestige of tankage in Germany they could get hold of. There was nothing left. I was sent there on three days' notice by my company, with which I was connected at that time, the United States Pipe Line Company, to look up the situation. We were here with our 15 refineries, with our pipe line running as far as it could toward the coast—we could not get any farther because the Standard Oil Company would not let us; but when I went to Germany in April, 1896, I went there on the report that Mr. Poth, with all his tankage on the Rhine, on the Elbe, at Flushing, Rotterdam and Amsterdam had been handed over to the Deutsche-Amerikanische Company. I do not know but the control belongs to the Standard Oil trust of America. They had purchased a man that we had supplied that oil to for four or five consecutive years, on whom we were dependent to take care of that market, that we might have the necessary money to run our refineries. They had bought it—nothing left. Where in the world we could place a single cargo of oil I did not know. Fortunately enough, I succeeded in selling three cargoes of oil to the Drennehaven Petroleum Company, which was then a Russian organization.

NEW CONNECTIONS FOR THE INDEPENDENTS.

Q. Russian? A. Yes. That three cargoes amounted to 90,000 barrels. I immediately went to Holland and let a contract to Mr. King for the construction of tanks. The city of Hamburg welcomed me there. They convened their congress in extra session and passed a law that they would furnish me ground upon which to build my tanks; and the contracts were let and the tanks finished in October, thank God, and our vessels went into the harbor with our petroleum. From there I went to Amsterdam, and they were constructing those tanks for us, because they wanted competition in the business. No competition is shut out in that country; no discriminating rates on the railroads in Germany; none on the canals.

CONTRAST BETWEEN CONDITIONS IN GERMANY AND CONDITIONS IN THE UNITED STATES.

I say today, with my years of experience in that country, it is one of the best governments on the face of the earth, because it looks out for the individual and offers him a helping hand. Do you get it here? No.

I am asked to come here today to go into matters I have been connected with from boyhood; not to injure Mr. Henry Rogers or Mr. John D. Archbold, my friend for 30 years, or any others connected with it. God knows I would not harm a single hair on their heads. I will tell you my side of the story, from 34 years of experience in the business, and from participation in the politics of the State of Pennsylvania—which, perhaps, is a credit and perhaps not. Whatever I may do or say here, it is not from malice of the heart, though perhaps it may be a mistake of the brain.

Q. (By Mr. Kennedy.) I asked you that question because I thought you said this practice of exclusion was being followed in this country, Germany and elsewhere. A. I did not say that it was followed in Germany; or rather, it was attempted in Germany, but is not permitted. We ask you to prevent it here. This Standard Oil Company is the parent trust of America. We in the oil business have had the experience of the struggle with monopoly from 1872 to this time. Now, whose toes are being pinched? Not the oil interests alone. It is not the ignorant only who are complaining. It is not the strikes of the coal men or of the railroad men or of the factory men alone. It has come to the intelligent part of this country. I wish to help you in every possible way to remodel our laws so we can all live, and if you don't the results are going to be very serious.

SIGNING AND RATIFICATION OF THE SOUTH IMPROVEMENT COMPANY CONTRACT.

Now, I did not intend to go off into these remarks not pertinent to the question. I do not know that it is necessary for me to read the rest of my pamphlet; but I desire to turn to page 48, and I will end up by saying this contract was signed—look at page 48 and you will see the name of P. H. Watson.

Q. (By Mr. Farquhar.) Did you intend that article five should be left out of your testimony? A. No; let the contract go in if you choose to have it. Cut out what you want to. I do not care, except as to the vital points. I just do not want to take up the time to read the rest of the contract. I simply want to show you that this contract was signed and this original copy has been in evidence—P. H. Watson, for the South Improvement Company, president, and the Pennsylvania Railroad, by J. Edgar Thomson, president.

Q. (By Mr. Phillips.) Have you read all you desire of that contract? A. Yes; I want to show that this contract was executed. Now I understand that it has been stated on the witness stand here that this contract was never executed or went into effect.

Q. (By Mr. Farquhar.) That statement was made broadly here. A. Now, P. H. Watson testified in Washington, in 1872, on the 5th day of April. Mr. Watson was president of the South Improvement Company, as I have shown in this agreement, and in this book of mine. I desire to read you (reading): "Q. Was there a ratification by the company of your contracts with the railroad"—

Q. Will you state the book and the page? A. Well, now this is an investigation in 1871 here in this city.

Q. Before congress? A. Yes; the congressional investigation.

Q. What session and what committee? A. Well, I can not tell you the session. It is dated Washington, D. C., April 5, 1872, if anybody knows the congress and the dates; and it is in the archives, I know.

Q. It is an official document? A. Yes.

Q. That is all I want to know. A. Mr. Watson was testifying as to the South Improvement contract that was agreed upon between the Pennsylvania Railroad and the two northern roads, the New York Central and the Erie. This is the contract which I have read a portion of. This book is precious. Nobody could buy it for $5,000, and I do not want it to go out of my hands, because it is history that is scarcely in existence. (Reading):

"Q. Was there any ratification by the company of your contracts with the railroad company?"

Now, this refers to the South Improvement Company. (Reading):

"A. Yes; they were approved by the board of directors, as appears in the minutes and as I am informed, it having been done at a meeting at which I was not present."

That is all I need to read. They were executed—"it having been done at a meeting at which I was not present"—by the board of directors. The contract was executed and when it was executed it was in force. It has been stated in testimony in 1888—I did not take occasion to refer to this at the time; I did not think it was of so much importance. But I say that the South Improvement contract was executed by the board of directors, as stated by the evidence of Mr. Watson, but he was not present. That is an answer to the testimony.

OFFICERS AND STOCKHOLDERS OF THE SOUTH IMPROVEMENT COMPANY.

Now, then, who were the officers and stockholders of the South Improvement Company? This is the testimony of William G. Warden, in Washington, March 30, 1872. (Reading):

"Q. Can you give the list of the stockholders of the South Improvement Company? A. I can give them from the minutes. They are as follows, Mr. Warden being secretary: William Frew, 10 shares; W. P. Logan, 10 shares; John P. Logan, 10 shares; Charles Lockhart, 10 shares; Richard S. Waring, 10 shares; W. G. Warden, 475 shares; O. F. Waring, 475 shares; P. H. Watson, 100 shares; H. M. Flagler, 180 shares; O. H. Payne, 180 shares; J. A. Bostwick, 180 shares; William Rockefeller, 180 shares, and John D. Rockefeller, 180 shares.

THE MEN WHO ORGANIZED THE STANDARD OIL TRUST.

Q. (By Mr. Phillips.) A good many of those afterwards became shareholders in the Standard Oil Company? A. The people who organized the Standard Oil Company were as follows: H. M. Flagler, O. H. Payne, William Rockefeller, H. Bostwick and J. D. Rockefeller. All these persons were stockholders of the Standard Oil Company at the time it went into existence, and they were the men who formed the South Improvement Company. I say that under oath; I know the people. The people who composed the South Improvement Company were finally the people to organize the Standard Oil Company of Pennsylvania.

DIFFERENCE BETWEEN STANDARD OIL COMPANY AND STANDARD OIL TRUST.

Q. The Standard Oil trust? A. The Standard Oil trust. Let me explain the difference. There are, I think, in the United States some 23 Standard Oil companies under regular organization. For instance, it is the Standard Oil Company of New York, the Standard Oil Company of Pennsylvania, the Standard Oil Company of Ohio, the Standard Oil Company of Delaware, of Maryland, of North Carolina, South Carolina, Texas, California, and what not; but the Standard Oil trust, as I understand, controls the whole. So distinguish the difference between the Standard Oil Company and the Standard Oil trust. I have reference now to the Standard Oil trust.

(Whereupon the commission took a recess until 2 p. m.)

WASHINGTON, D. C., *September* 11, 1899.

Monday P. M.

Commission reassembled at 2 p. m. pursuant to adjournment, Mr. Phillips presiding.

Lewis Emery, jr., again on the stand and examination resumed.

HOW THE NATIONAL TRANSIT COMPANY (STANDARD) GOT THE SAME CORPORATE POWERS THAT THE SOUTH IMPROVEMENT COMPANY HAD HAD.

Q. (By Mr. Phillips.) Senator Emery's statement will be resumed and he will proceed to make his statements in his own way. A. Mr. Chairman and gentlemen of the commission, there seems to be some misunderstanding relative to the charter under which the South Improvement Company was organized and the charter under which the National Transit Company is organized, it being one of the several companies of the Standard Oil trust. I desire to say that all the privileges granted in the South Improvement Company's charter were also granted in the charter of the National Transit Company. Both are in the same terms. Each is what is known as the Pennsylvania Company charter. I desire to prove my assertion. I will refer

first to page 15½ of the book that you have before you. (Reading):

"When the popular excitement raised against the South Improvement Company, which resulted in the repeal of the act to incorporate it, had subsided, the trust, for the purpose of its transportation business in Pennsylvania, secured a franchise substantially as follows: An act to incorporate the Overland Contract Company was approved March 22, 1871."

This was just previous to the act of incorporation of the South Improvement Company. The South Improvement Company's charter was passed on the 6th of May, 1871, and the Overland Contract Company's charter, under which the National Transit Company is now organized, was passed March 22, 1871, before the passage of the South Improvement Company's charter. I desire to get that plain before the commission. (Reading:)

"Letters patent were granted them April 5, 1871. On May 16, 1871, they changed their name to the Southern Railway Security Company. They owed the State of Pennsylvania one-quarter per cent bonus on their capital stock, and for this debt, after a compromise had been effected, it was sold by the sheriff of Dauphin county to John W. Simonton and Marlin E. Olmsted for $16,251 on March 8, 1881, upon a judgment entered September 13, 1881."

This judgment was entered by the Commonwealth of Pennsylvania. (Reading:)

"April 13, 1881, John W. Simonton and Marlin E. Olmsted sold it to Clement A. Griscom, Thornton Pike, Elihu Roberts, W. H. Curtis, William R. Williamson, J. W. Simonton, and M. E. Olmsted. On April 14, 1881, under this charter the National Transit Company was organized."

I read from a book in the supreme court of Pennsylvania, eastern district No. 257, January term, 1897:

"National Transit Company and J. C. McDonald, appellees, vs. The United States Pipe Line Cimpany, appellant. Appeal by the defendant from the court of common pleas, McKean county, sitting in equity, October term, 1896. Paper book of the appellant. J. W. Lee, W. E. Burdick, solicitors for the appellant."

I desire to read from this book, and whatever I read from it, so far as this charter is concerned, is a transcript of the record of the department at Harrisburg, certified to the sercetary of state, so that the evidence I shall read is absolute and can not be questioned. I first desire to read on page 429 of this book:

"Commonwealth vs. The Southern Railway Security Company. Resolution of company fixing the amount of capital stock. Southern Railway Security Company in account with the Commonwealth of Pennsylvania."

Mind you, this charter lay for a long time in the archives of the state. It was discovered, and it was purchased by the parties I have named. (Reading:)

"Southern Railway Security Company, in account with the Commonwealth of Pennsylvania, debtor, for bonus on charter, per act of May, 1, 1868. Amount charged in settlement in May 20, 1873, $25,000. Capital stock, $7,788,150 appears through certificate herewith filed. Bonus of one-quarter of one per cent on said capital stock, $18,470.37, making a total debtor charge $43,470.37. Credit by payment in the charter March 16, 1871, $125. By settlement of May 8, 1873, hereby superseded, $25,000. Deducting the credits, $25,125, from $43,470.37, due the Commonwealth, $18,345.37. Attorney general's office, Harrisburg, April 25, 1870. Settled and canceled. Harrison Allen, attorney general. Treasurer's office, approved. W. E. Hitt, for W. Mackley, State Treasurer. B. F. Newcombe, treasurer Baltimore and Ohio. Indorsed, bonus on charter, account of the Southern Railway Security Company, resettled April 5, 1875."

Now, I do not think it necessary for me to go further with this, only as showing the sale, and I have shown you already that this identical charter was bought from the state by J. W. Simonton and Marlin E. Olmsted for $16,251. This is a copy of plaintiff's exhibit in this suit, called exhibit A. This is offered by the National Transit Company. (Reading:)

"National Transit Company charter. An act to incorporate the Overland Contract Company and to define the powers thereof. Be it enacted by the senate and house of representatives of the Commonwealth of Pennsylvania, in general assembly met, and it is hereby enacted by the authority of the same."

Mind you, now, the same persons got the charter in this one as in the other, "S. S. Moon, R. D. Barclay, John A. Fowler, or a majority of them, their associates, successors and assigns be and they are hereby authorized and empowered." Same incorporators as the South Improvement Company, you will note. Approved the 7th day of April, A. D. 1870. Statements as made herein were specially and particularly set forth."

THE PENNSYLVANIA COMPANY'S CHARTER.

Now follows "an act to incorporate the Pennsylvania Company" under that head which I have shown you was changed to the name of the Southern Railroad Security Company, and finally was changed to the National Transit Company. (Reading:)

"Be it enacted by the senate and house of representatives of the Commonwealth of Pennsylvania in general assembly met, and it is hereby enacted by the authority of the same. That Andrew Howard, J. W. Swartz"—

Please refer back in my pamphlet and notice that I am not making any statement incorrectly, and follow me and see if the act is not just the same as that of the South Improvement Company. What I desire to show to this committee is that the privileges exercised by the National Transit Company are the same as those set forth in the charter of the South Improvement Company. They are enjoying all the privileges and immunities that were granted by that law.

Q. (By Mr. Ratchford.) What page is that? A. Seventh page.

Q. (By Mr. Phillips.) You can read the two paragraphs to identify it. A. I do not want any mistake because I am making the statement very broadly. This is it, the same identical charter, page 6, to the South Improvement Company.

Q. You will leave this with the commission to show that it is the same? A. I will file this book under the seal of the court.

Q. It is quite long and will take time to read it? A. I will read the second section if you will please follow me through. This which has been repealed is the same as this. If there is any difference I want you to state it. (Reading:)

"That the corporation hereby created shall have power to contract with any person or persons, firms, corporations, or any other party, howsoever formed, existing, or that may hereafter exist in any way that said parties or any of them may have authority to do. To build, construct, maintain, or manage any work or works, public or private, which may tend or be designed to improve, increase, facilitate, or develop trade, travel, or the transportation and conveyance of freight, live stock, passengers, and any other traffic, by land or water, from or to any part of the United States or the Territories thereof; and the said company shall also have power and authority to supply or furnish all needful material, labor, implements, instruments, and fixtures of any and every kind whatsoever, on such terms and conditions as may be agreed upon between the parties, respectively, and also to purchase, erect, construct, maintain, or conduct in its own name and for its own benefit or otherwise any such work, public or private, as they may by law be authorized to do (including also herein lines for telegraphic communication), and to aid, co-operate, and unite with any company, person, or firm in so doing.

"Section 3. The company hereby created shall also have the power to make purchases and sales of, or investments in, the bonds and securities of other companies, and to make advances of money and of credit to other companies, and to aid in like manner contractors and manufacturers, and to receive and hold, on deposit or as collateral, or otherwise, any estate or property, real or personal, including the notes, obligations, and accounts of individuals and companies, and the same to purchase, collect, adjust, and settle, and also to pledge, sell, and dispose thereof, on such terms as may be agreed on between them and the parties contracting with them; and also to indorse and guarantee the payment of the bonds and the performance of the obligations of other corporations, firms, and individuals, and to assume, become responsible for, execute, and carry out any contracts, leases or subleases made by any company or companies, individuals or firms whatsoever."

Please return to section first; I want to get rid of reading as much as possible. I will read the first section. (Reading:)

"Section 1. Be it enacted by the senate and house of representatives of the Commonwealth of Pennsylvania in general assembly met, and it is hereby enacted by the authority of the same, that Andrew Howard, J. S. Swartz, G. B. Edwards, J. D. Kelso, and J. T. Malin, their associates, successors, and assigns, or a majority of them, be, and they are hereby, authorized to form and be a body corporate, to be known as the Pennsylvania Company, and by that name, style, and title shall have perpetual succession, and all the privileges, franchises, and immunities incident to a corporation; may sue and be sued, implead and be impleaded, complain and defend in all courts of law and equity, of record and otherwise; may purchase, receive, hold, and enjoy, to them, their successors and assigns, all such lands, tenements and leaseholds, estates and hereditaments, goods and chattels, securities and estates, real, personal and mixed, of what kind and quality soever, as may be necessary to erect depots, engine houses, tracks, shops, and other purposes of said corporation, as hereafter defined by the second section of this act, and the same from time to time may sell, convey, mortgage, encumber, charge, pledge, grant, lease, sublease, alien, and dispose of, and also make and have a common seal and the same to alter and renew at pleasure, and ordain, establish, and put in execution such by-laws or ordinances, rules and regulations as may be necessary or convenient for the government of the said corporation, not being contrary to the constitution and laws of this Commonwealth, and generally may do all and singular the matters and things which to them shall appertain to do for the well-being of the said corporation and the management and ordering of the affairs and business of the same; provided, that nothing herein contained shall be so construed as to give to the said corporation any banking privileges or franchises, or the privilege of issuing their obligations as money."

Now, gentlemen, they were afraid of repealing the Constitution of the United States, or else they would have put in the privilege of issuing money; they have put in everything else.

Q. (By Mr. Clarke.) How do you know that, Senator? A. Why, by the reading of the act. They have got the right to do everything else; they claim they have; that is what it reads—to do anything they have a mind to.

Q. (By Mr. Farquhar.) Is it a rule to withhold from corporations banking privileges? This same clause is inserted in the charters of all corporations which are not banking corporations? A. It is within the provence of the United States to authorize the issue of money.

Q. Is it not a fact that all of our State laws, in the act of incorporation, contain this clause that would shut out banking privileges? A. Not being a lawyer, I do not know.

IDENTITY IN TERMS OF THE SOUTH IMPROVEMENT COMPANY'S CHARTER AND THE EXISTING CHARTER OF THE NATIONAL TRANSIT COMPANY—POWERS IN OTHER STATES.

Q. (By Mr. Kennedy.) What does this mean? Does it mean anything more than any other corporation might do, or business man? A. Oh, no; I only want to show you that the same law was repealed, known as the South Improvement Company law, was identical with this. This is one and the same thing; the privileges that they had under this law in 1872 they have at the present time under this law. That is all that is what I wanted to say.

Q. (By Mr. Farquhar.) One point on that, Senator. These are privileges granted by the State of Pennsylvania? A. Yes.

Q. There are twenty or more organizations of the Standard Oil Company—could any of the other organizations of the Standard Oil Company take up these privileges? A. Could they?

Q. Yes; under the State of Ohio, for instance. A. This law says they can; they can go into any other State. It says so. I do not know whether they can legally or not; but that is what it says. The Pennsylvania Railroad runs—the Pennsylvania Company runs through a portion of Ohio, does it not?

Q. (By Mr. Harris.) That is under a separate organization. One is called the Pittsburg, Chicago and Fort Wayne. A. I understand the Pennsylvania Railroad enjoys all these privileges, although they may be in foreign States, under the Pennsylvania Company's charter. I will submit that to the lawyers. We love lawyers.

Q. (By Mr. Farquhar.) The only question is this: Whether the Standard Oil Company, with all its franchises, could enjoy all the privileges which are conferred by this charter in the State of Pennsylvania in any other State? A. Subject, I suppose, to the State law. I think that would be perhaps the proper answer to it.

Q. (By Mr. Phillips.) Please proceed. A. Now, gentlemen, I have gone back to correct this. I want to show just exactly the identity of these two laws, one repealed and the other in existence, because the question was raised by two or three of the commissioners whether the one charter was like the other. I think I have proved that to them satisfactorily by reading from this book, and I will leave that book with the commission when I go.

Q. (By Mr. Farquhar.) Would it not be well to suggest that you furnish the commission chronologically with the dates, if you can, of these various charters? A. The origin of them?

Q. The origin of them, the change of name, and the year and month, if you possibly can, so that we may see the connection and the interest that follows from the beginning clear down to the end? A. I am prepared to give you all of that.

Q. (By Mr. Phillips.) I think the commission would like to have you before you go away.

Q. (By Mr. Farquhar.) I know you can, because I find dates on page 15½. A. This book contains a vast amount of knowledge on everything that you have asked, compiled in legal form and with an affidavit of the secretary of the Commonwealth as to its correctness, so you may not be misled or go astray.

AMOUNT OF AMERICAN OIL USED IN EUROPEAN COUNTRIES.

Q. Where you have spoken of the opposition and interference of the German government, could you give the commission an approximate statement of the oil sold in Germany at that time by the Standard, by all the Russian companies, and by the independents? A. I can give the statistics.

Q. That probably is in your mind? A. No, I can not do it here. I can give you the statistics of the sales in the German Empire; I know roughly what they are now. I know that the German Empire consumes, at the present time, 6,000,000 or 7,000,000 barrels a year of the American production.

Q. (By Mr. Phillips.) About how much is furnished by the Standard Oil Company and by affiliated companies, and how much by this company you have organized? A. I knew the statistics two years ago. About 6,000,000 barrels of the American product was consumed in Germany; Great Britain was using 3,000,000 barrels; France was using about 2,000,000 barrels; Norway and Sweden were consuming about. 1,000,000 barrels; Denmark, about 600,000; Holland and Belgium, I forget.

Q. What proportion of the oils of the Russian and the Standard were sold there through 1895 and 1896? A. The Standard sold all the American oils in these markets with the exception of what was taken in by our independent companies. I think the largest exportation we have ever made—in fact, in 1894, I think, we sold over there about 400,000 barrels, and up to the time Mr. Poth was purchased by the Amerikanische—I think our sales were about 700,000 barrels.

ATTITUDE OF THE RUSSIANS TOWARD COMPETITION AND REGULATION IN GERMANY.

Q. You spoke of regulations made by the German government there. Did those cover the competition between the Standard and the Russians? A. In what respect?

Q. In respect to fair competition. A. The Russians were in just as bad a position as we were. They were independent at that time.

Q. Would you care to state whether, if the Standard then had the market there, both the independents and the Russians were desirous of having this free competition? A. I do not understand you.

Q. That is, are we to understand that the Russians, as well as the independents, wanted rectification from the German government of unfair competition from the Standard? A. I do not know what the Russian government did. I know that when I was in Europe I went on to St. Petersburg and had a conference with Mr. Noble, and also with the prime minister. Their views were just the same as ours, that they were under an unfair competition and would like to see it rectified. I went there to see if something could not be done, and I brought American influence to bear on the Reichstag to see if something could not be done to correct it. The whole question was laid before the prime minister of Russia and Mr. Nobel to find out from the Russians if the conditions existing in the trade were the same to all.

GERMAN REGULATIONS—GOVERNMENTAL EXAMINATION OF ACCOUNTS WOULD BE A GOOD THING HERE.

Q. (By Mr. Kennedy.) Did you get a charter in Germany from the imperial government? A. No; the right to sell only, and then we are required to file our organization or charter. We only get a license to become merchants, that is all.

Q. Are your business affairs then subject to the supervision of the German officials? A. Oh. yes.

Q. Inspection of your books? A. Yes; whatever the law is we have to conform to it. I do not know whether that is the law; whether they can go to our books or not. Whatever the law is, that is the situation in which we are placed. We are glad to have them examine our affairs. Even in this country I wish something of that kind could be established, that all the books of these corporations of every kind should be examined.

Q. Would you like to see the nationalization of the corporations doing interstate business in this country? A. Well, I heard this question brought forth the other day in the evidence of Henry Rogers. I am not prepared to say; I have not studied the question. I do not know about the English law controlling corporations or about the capitalization or the constitution of business in England, except to a limited extent.

CHARACTER OF EXPORT OIL AND OIL FOR DOMESTIC USE.

Q. What is the quality of the oil exported from this country to Germany and other European countries? A. 73° Abel, or 112° fire test.

. What is the quality of oil generally consumed in this country? A. About 120° to 150°.

Q. So it is an inferior grade of oil sent abroad? A. No; it is oftentimes a very much better oil than we get here under 150°. Let me explain.

METHODS OF DISTILLING OIL—THEY ARE THE SAME AS IN 1860.

I want to state here particularly, and I want you to understand my statement as a manufacturer of oil from 1867 to 1899, that the Standard Oil Company are not benefactors and never have been benefactors. If the business had been open to the community, and the people engaged in it with their brains and ability, the development that has come up to the present time, I claim, could have been made twice as quick as they have made it. Why do I say so? Because in the year 1872 our company, known as the Octave Oil Company, was the owner of one of the best refineries on the creek—Oil Creek—right opposite that of—— —— & Co., the company being John D. Archbold, who was on this stand, and others. We had every device at that day for making an illuminating oil of good quality that we have today. We had stills that held from 100 to 3,000 barrels, Mr. Archbold having the largest still that ever fire was put under, holding 3,000 barrels of crude oil. To distill oil is not difficult. It simply means that if you build a fire under that glass (indicating), supposing it was oil, and you inclose it, the steam comes out—the vapor. That is all we do in making oil. We put in these great cylinder stills, and the cylinder stills of 1870, 1868, 1865, and 1860 were the same as the cylinder still of today. There was what was known as the cheese box, which set up like a cheese box, with a grated bottom to make a fire on. But we have gone back to the old system. In spite of the modern improvements these people claim to have injected into the business we are back where we were in 1859. We put a fire under it, the vapor rises off and gives first the lightest possible oil, the cymogene; the very lightest, like carbonic-acid gas, and the moment it comes to the air it is gone. Next we come to the next lightest, gasoline. Then we come to the naphtha, and then we come on down, if you choose, to the heavy benzine. The lighter parts come off first, from which are made the various light products that are in the market, such as you use in the gasoline engines and in the kitchen to cook with and such as are used by chemists and druggists and the commercial trade. Then you come to the illuminating oil.

MEANING OF "110°" OIL—IF PROPERLY REFINED, THERE IS NO BETTER.

The first illuminating oil is the lightest, 110° oil. You may recollect that we had in this country a general law of the States requiring oil to be of 110° fire test. That means that, putting the oil in a certain kind of instrument, it has to be heated to 110° before it will burn. It may flash at 85, but would go out. You go on up to 110° and it burns. That is the burning test, the flash test being at 85°. That is the way oil is tested. It went on for years and years, until the advent of this South Improvement Company and the Standard Oil Company. That remained a law of the States, and the law was good. There was no adulteration of it. Perhaps adulteration is not the term. When I say oil is adulterated I mean it is not properly refined; it is not properly broken up by heat; the paraffin is not taken out of it. Oil may retain a vast amount of paraffin, and show under the law 110°, but its burning properties are not good. Oil properly refined under the 110° system is the best oil you can put into your lamps. The German government—the entire German Empire—the Kingdom of Norway and Sweden, Denmark, all these countries require no other than 110° or 73° Abel. That oil is not inferior. Neither the German government nor any other government on that side of the world will permit you to send in an inferior article. There is an educated chemist at every distributing depot in that country, who tests that oil and carefully weighs it, and gives it the proper fire test; and it must pass according to the requirements of the law. That is one reason why the Ohio production has been practically ruled out of Germany because of its quality. The great German Empire and other countries are depending today, under the laws, upon the American product, because Pennsylvania and a portion of eastern Ohio and southern New York and West Virginia produce the best oil in the world.

SULPHUR CAN NOT BE GOT OUT OF OIL; THEREFORE OHIO OIL CAN HARDLY BE SOLD IN EUROPE.

Q. (By Mr. Kennedy.) The Standard people on the stand claim they have processes now for eliminating sulphur and other impurities from the oil and making it equal to the Pennsylvania oil. Is that true? A. I say here, as a refiner and a man who has in his employ as good a chemist as there is, that they can not do it, and they do not do it. You can not eliminate sulphur.

It will come back in some form. Canada has been working on it for the last thirty years and spent untold millions, and she has never been able to accomplish it entirely. It baffles all science to eradicate, and is detected by the chemists in Europe as quickly as possible, unless it may be mixed with Pennsylvania oil. That has been done before. The high grade petroleum oils are used to supply the European countries. As to what goes to India and what goes to China I am not posted; but I do know what goes to the other countries, and they expect to get an absolutely pure oil. The consumption of Ohio oil is confined to the United States and Mexico, and perhaps to some of the other southern countries. I do not know about that, but the market is not in Germany to any great extent.

CHARACTER OF EXPORT OIL AND OIL FOR DOMESTIC USE (RESUMED.)

Q. (By Mr. Clarke.) How is the grade of oil determined, if not by the fire test? A. What do you mean—the smell?

Q. Whether the high grade or the low grade? A. The oil in its grade is designated by fire test. For instance, 110° oil is what we term the ordianry export oil, 112° test; 120° test is supposed to be a bit better in quality; 150° test is the common oil used in this country, and is a little bit better. The making of 150° oil is just exactly like making what they call patent flour. It is the head of the bolt. I am a miller by trade and acquainted with the making of flour in the modern way and the old way. If you want patent flour, you have to take the head of the bolt or cream of the wheat. You can get a certain limited amount of patent flour out of 100 pounds of wheat; so you can get a certain amount of 150° or 175° oil out of a certain amount of petroleum. In this country, I will say, we take off what we call the higher grade of oil and the balance is sent to Germany and other countries. But in order to get these high test oils up to what they should be, we make the others not as good as if we had just sold the whole thing together. Just so with our flour. If you sort out the best part of your wheat, the next grade is not as good, although it passes as good family flour, and this passes as export. In answer to Mr. Kennedy, the standard has not been changed in Germany. They have the finest lamps in the world. They are the greatest inventors of illuminants, and and they have continued to hold their grades the same as 25 or 30 years ago. We want to send that class of oil into these countries, and they are satisfied with it, because it cames within the reach of the man who wears wooden shoes; it is a commodity they must all buy, and is lower in price than the higher grade.

Q. (By Mr. Kennedy.) It is a fact, then, that the oil exported to Germany is inferior to the oil generally used in this country? A. That may be; but I want to say to you, in the United States of America they burn the meanest oil in God's earth, and burn the best oil that is put on the market. In California—I have spent two years there—I have a little hut, and I go down and buy a case of oil. I buy it as Pratt's Astral, a high grade oil; it used to be the highest grade on the market. I might say here, during my early experience in the refining business, from 1867 to 1872, we manufactured and sold thousands and thousands of barrels of oil to Charles Pratt and other companies for exportation to Europe, and we were obliged to leave the head blank. When it got to New York the quality of oil was put on it—"Pratt's Astral." He bought oil from the Octave Oil Company. My oil was taken by him and sent to Europe. Now let me give more credit to the Standard Oil Company.

Q. (By Representative Livingston.) Do they not require, in Europe and in many states of this country, an oil inspection and require you to come up to the grade? A. In every little port where oil is sold or distributed there is a man who examines the oil, and it is passed on by the government inspector.

110° OIL AND 150° OIL.

Q. What do you mean by first, second and third grade oil? Does the first have less naphtha or more? A. It is supposed to be better. One hundred and fifty degree oil is supposed to be the acme of oil in this country. You fill a lamp with it and you may get a little brighter light than you would get from 110°; there is not so much naphtha, not so much gas; but the 110° oil will last in your lamp a great deal longer than the 150°, because there is not so much body in it. the 110° will not give so brilliant a light as the 150°; that is one reason why Germany holds to that oil test.

Q. Is it not more subject to combustion than the 150°. A. One hundred and ten degree? Oh yes. It requires 110 degrees of heat to burn 110° oil, and it requires 150 degrees of heat to burn 150° oil. If a lamp is heated to 150° at its top gas will be created in the body of the lamp, and unless you release that gas it will explode.

Q. If either comes in contact with a flame, will one burn as quickly as the other? A. The 150° will not burn as quickly as the 110°. Oil is nothing but gas, practically. Take a pail of crude oil and put it out here in the sun; in all probability by night you will have lost 10 per cent of it. It has gone into the air as gas.

Q. (By Mr. Phillips.) Your testimony has not been quite clear about 150° burning quicker than 110°. A. One hundred and ten degree oil burns at 110 degrees of heat, and 150° will burn at 150 degrees of heat—that is, the burning test. The higher the test the safer the oil, so far as explosions are concerned.

Q. Which will burn up quicker in the lamp? A. That does not make a bit of difference. The wick is saturated and it burns at all times. The blaze from 110° is not as brilliant as that from 150°.

Q. (By Mr. Kennedy.) The German does not get as good light from his 110° as he would from 150°? A. That is true.

Q. They get what they want and are satisfied? A. Yes. Good 110° oil is a good oil. It is the cheapest for all the inhabitants of this country, and safe enough, because we burned it for years and years. There was no change in the laws of any of the states, so far as I know, until after 1872. Pennsylvania retains still

the 110° test; North Carolina, Texas and a good many of the southern states have the 110° test; not many of them have changed. The state of Michigan has 175°, if I remember right.

RUSSIAN COMPETITION—CHARACTER OF RUSSIAN OIL.—PER CENT OF ILLUMINATING OIL OBTAINED FROM CRUDE.

Q. (By Mr. Kennedy.) Do you come into competition in Germany with Russian oil? A. Yes.

Q. Do they have to make that test of 110° the same as you? A. Yes.

Q. What is the uality of their oil? A. Not so good as that of America—not so good as American 110°. The Russian is of an asphalt basis, while ours is paraffin. Pennsylvania and New York oils are paraffin, and the Ohio is of a paraffin basis. The California oils have an asphalt basis and the Russian oil has an asphalt basis. The American oil will produce an illuminant of 75 per cent. For instance, 100 gallons of crude oil of America, of what we call the Pennsylvania, the West Virginia and New York and Eastern Ohio oil, will produce 75 per cent of illuminating oil of different grades. If you ran it all straight through and did not cut them out, you probably would get out 78 per cent.—perhaps 79 per cent.; but, speaking as it runs, you can get 75 gallons of illuminating oil from every 100 gallons of crude oil. The gravity of this oil will run from 40 to 52; the Russian oils run from 18 to 30. Its basis being asphalt, they can only get from that, of the ordinary export oil, such as 110°, about 25 per cent.

Q. Does their 110° oil sell for the same money in Germany as ours? A. No, it does not sell for the same money as our 110°, because it is not as good as our oil. It contains a little sulphur, the same as the Ohio, which is not as marketable as our good oils are.

Q. Russian competition, then, is not serious on that question? A. It is, because they sell their oil at a less price, and we have to meet it; but we have the advantage of quality.

FOREIGN TRADE—THE STANDARD HAS INVENTED NOTHING.

Q. (By Mr. Phillips.) Now, I would like you to state how widely petroleum was introduced into the world at the time of the advent of the Standard Oil Company? Whether they have been very largely—? A. I want to say in answer to that question, in 1871 or 1872, when we were young and enterprising, we went to the city of Philadelphia and secured a sailing vessel. It was our determination to load that vessel with all the different inventions for burning oil—lamps, oil stoves, etc.—and also to put into the ship our oils in cases or barrels, such as we could carry; and we had arranged with one Captain Dillingham to sail that vessel to the Amazon and go up the Amazon and introduce this product, oil, which was a new commercial commodity, and the result was we did not do it. On came this clash of arms and we did not go. I will read you why we did not go.

Q. Can you state how far it had been introduced to the world before that time? A. I must say in answer to that, that the production of oil in 1872 was about 16,000 barrels of oil per day; back in 1870 it was 15,000 barrels of oil a day. For all that great quantity of oil, from 1860 to 1872, a market had grown up throughout the world, as we knew the world at that time. It was a good while ago, of course. There were in the field at that time upward of 150 refineries, and as I said before, with all the modern improvements that existed, so far as making illuminant was concerned—I want to give credit to the Standard Oil Company for this fact that, owning the business, practically, it was dependent upon them to bring out all the by-products from the residuum. They made a wonderful success of it. But do you suppose that I or any other active man, with brains and capacity, could not have done the same thing if we had had the opportunity and been left to ourselves to manage our business? Has not the iron business passed from all the world to the Sierra furnace, and every other improvement been brought about by general trade? Can one man in the business claim he was the only brain in it? Nor is it true of the Standard Oil Company. I say particularly they never invented anything. As somebody said, they did not even invent the rebate. They were dependent on the brains of the average man. They have done nothing that any member of this commission could not have done had you had the opportunity to do it, and get your product to market over the transportation lines of the country.

THE STANDARD HAD TO DEVELOP THE USE OF THE BY-PRODUCTS.

Q. (By Mr. Kennedy.) You were just giving the Standard Oil Company credit for the wonderful growth of the by-products? A. Yes, because I have to.

Q. Do you manufacture any of these by-products, such as vaseline? A. I make the crude stock.

Q. And sell that to the Standard? A. Not entirely. I presume they buy some of it. I make all of these products. I turn out from thirty to thirty-five thousand dollars' worth every month. Perhaps I have one of the largest refineries in existence outside of the Standard.

Q. Can you manufacture these by-products just as well as the Standard Oil Company and put them on the market? If we were in like circumstances we could; but you understand, the by-products are manufactured not only by the Standard, but in a small way by others. For instance, the druggists manufacture their own, and they come to me to buy the stock; but the Standard Oil Company, I mean to say, were the first, through the agency of somebody else's brains, not their own, to establish these factories. I say to you this product of petroleum is most wonderful. Chemistry knows nothing about it even to this day, and our colleges have scarcely taken up the science of petroleum. We have to depend on Europe for the knowledge we have obtained as to these by-products.

Q. (By Mr. Clarke.) I can not see why you can not

produce these by-products. A. We can. I am not complaining about that.

Q. (By Mr. Farquhar.) Do you not sell the by-products to anybody? A. Certainly.

Q. All refineries do? A. Yes.

Q. (By Mr. Phillips.) Is it on account of the large amount the Standard refines that they have established these different plants to produce these by-products? A. They, having control of the business from 1872, had to take care of them. There was no one in the business to take care of them.

Q. What is the chief by-product from petroleum; is it not lubricating oil? A. No.

Q. What is it? A. From the by-products of petroleum there enter into the materia medica over 200 remedies.

Q. Do you speak of coal tar, etc.? A. In addition to that the beautiful analine colors are produced from the coal tar you speak of. Thousands of things are made from petroleum; but that has come on with time, just as the time was when we could not make a piece of sheet steel.

LUBRICATING OIL IS NOT A BY-PRODUCT; NOR PARAFFIN WAX.

Q. How about lubricating oil? Is it not a very large by-product? A. No; it would not be termed a by-product, because there is not a lubricating oil produced from the crude. That never sees fire at all, some of the richest.

Q. (By Mr. Ratchford.) How about paraffin wax? A. It is one of the products; not strictly called a by-product. The by-products, as a rule, arise from that which remains in the still, or the top, which runs anywhere from 6 to 10 or 12 per cent. From that is made the paraffin oils, red oils, yellow oils and miners' oils. These things coming from the top are strictly the by-products. The petroleum wax comes at a certain point in distillation, if you take it out. You take it out when wax is dear, and perhaps leave it in when wax is cheap, whichever pays best. You can take out the wax whenever you want to, or break it up by heat, by destructive distillation, and put it into illuminating oil.

RELATIVE VALUE OF PRINCIPAL PRODUCTS AND BY-PRODUCTS—THE STANDARD HAS NO MONOPOLY OF MANUFACTURING BY-PRODUCTS.

Q. (By Mr. Kennedy.) State in dollars, if you can, what your income from the by-products of oil or petroleum is compared with your income from illuminating oil? A. I could not.

Q. Could not approximate it? A. I can not answer the question, because I do not make any paraffin oil. I make wax and what is called petrolatum, or what you know as cosmoline—all the same thing; all these "lins" are one and the same thing.

Q. I think the Standard people have testified that one-half their business is perhaps in the by-products. Would that be so in your business? A. No; but I have no reason to contradict their statements. I should not put down the by-product or the residuum as being a half of their business—not by any means, because, as I have said, you get 75 per cent of illuminating oil, while you will get 10 to 12 per cent. of benzine or gasoline.

Q. I mean in value.

Q. (By Mr. Farquhar.) The statement is that the by-products amount to nearly half in value, on account of the high price of certain by-products; provided, of course, the Standard or these other manufacturers utilize these by-products themselves, instead of selling the residuum for others to manufacture.

A. I could not affirm or deny that.

Q. (By Mr. Kennedy.) Have the Standard people a great advantage over you in the development they have brought about of the by-products of petroleum? A. There are no developments today that any man can not enjoy if he wants to.

Q. You give them the credit of developing it? A. I do; because there was no one else to bring it up. The business has been in their hands from 1872 to the present time.

Q. (By Mr. Phillips.) Your understanding is the by-products were not so valuable before their advent? A. I mean they were not developed; they are not developed today.

VALUE AND USES OF PARAFFIN.

Q. (By Mr. Ratchford.) It has been stated that as the by-products of the refining of oils are comparatively new products it has cost more to market them, in many cases than has been derived from their sale. What is your experience in that? A. I do not think it is true.

Q. If that statement is true, I wanted to know whether in your judgment the price of the main product should not be reduced to the people as the value of the by-product increases? A. Until the general rise of business these things that you term by-products did not bring a high price. I sold wax as low as 1¼ cents a pound within the last three years. We had to take what we could get for it. Germany and France were full, the factories were full, people did not want any goods, and there was no market for it. We make about 4,000 to 6,000 pounds a day of it; two or three tons of nice bleached wax, white as that paper, and we get today, I think, about 3 3-8 or 4 cents a pound. It is not high, and really I do not see how you could reduce the price of that commodity very much.

Q. The main use to which that wax is put is the making of candles? A. Oh, no. You can not make a joint of pipe without the use of paraffin wax; you can not string a telegraph or scarcely a telephone line without the use of paraffin wax. It is used in almost everything where protection is required, because it is a non-conductor. It enters into everything pertaining to electricity. It is not used largely in candles, except in connection with stearin. The Standard mold all the candles of the country, and they mold the public opinion of the country pretty near. They are good molders; no question about that.

THE STANDARD RETARDED THE DISTRIBUTION OF OIL.

Q. (By Mr. Phillips.) Will you return to that question as to how widely the use of it had gone into the world? A. I want to say in answer to that every civilized country where oil is used had its representative in New York, Philadelphia, Baltimore, Pittsburg, Oil Creek, Portland, Bremen, Hamburg, Paris, London and Liverpool, and they were asking for these goods. It was pretty much all over the world before ever the Standard Oil Company was heard of. They retarded the distribution of this commodity. I was willing to go to the ends of the earth to make a market, and other manufacturers were willing to go with me and make a market; but in the first history of this business the Standard Oil Company compelled these men to step over the threshold of their offices to get this commodity. That was the condition.

THE STANDARD HAS NOT CHEAPENED OIL.

And yet they say that they are benefactors, benefactors of the people, for reducing the price of the commodity. Why, I have known a single gallon of oil to sell within the territory of the United States at one and one-half times the cost of a barrel of crude petroleum to make it, but you can not get that today. The moment you enter the market of Hornellsville, Washington or Wilkesbarre, if you choose, with oil from an independent refinery and build your stations and office, down goes the price. Not four weeks ago, when I sent my oil to a certain point the market was reduced one cent a gallon because I came there. It has been well said, "This business belongs to us; you get out." Take up that volume; read the Commonwealth vs. The Pennsylvania Railroad; it gives everything. The Standard Oil Company are not entitled to the credit of being benefactors or of cheapening this product. Wails are coming up from New Mexico and from Texas and from every state in the Union on account of the exorbitant price and poor quality of the petroleum; you have read them. Look at the condition of things. Laws are passed by several states of this Union against encroachments on the rights of the people, but when it comes to appropriating money to carry out these laws, the third house men say to the farmer, "If you vote for the appropriation that will put this law into effect you are going to increase your taxes." The result is they strike out the appropriation that should enable the attorney generals of the several states to enforce these laws. An attorney general stated in an article just a short time ago: "I have to put my hands in my own pocket to pay the necessary fees to bring this suit; no appropriation." Whenever legislation cannot be stopped against these people, they go to the next resort and stop the appropriation. I do not say they do it, but I say it happens.

THE STANDARD CUTS PRICES WHERE COMPETITION APPEARS.

Q. (By Mr. Ratchford.) You made a statement that if you erected stations or tanks in Wilkesbarre, for instance, the Standard would reduce the price of oil? A. That is true.

Q. Can you furnish this commission with a specific instance where this has been done? A. Oh, yes; I can furnish you a hundred of them. Take it in Philadelphia: I lost $150,000 in one station myself in lowering the price from time to time. My wagon was there with my man on it. Their wagon would come in ahead of me. They would go to that customer and reduce the price, and they would say they would sell him oil cheaper. They employed other fellows to watch where I went.

Q. (By Mr. Phillips.) When did this occur? A. It has occurred during the years 1891, 1892, 1893, 1894, 1895 and 1896. It occurred right along until I quit there.

Q. Has it occurred since you departed from that station? A. Yes; it has occurred within the last six weeks—reducing of the price.

Q. How about New York city? Has there been any reduction there? A. I have known New York to sell oil at six cents; when the Columbia Company put on their wagon it was five cents in 10 days.

Q. Has that continued to the present time? A. I do not know; I have been away two years.

Q. (By Mr. Clarke.) Did you ever reduce your price to get business? A. Have to; have to compete.

Q. Do you have any competitors besides the Standard? A. Yes.

Q. Do they follow you up? A. The other competitors? No.

Q. Never? A. Never.

Q. Do you try to follow up anybody? A. Never.

Q. Do you ever reduce your price before the price is reduced by your competitor. A. Oh, yes, I suppose so. It is trade. I am merely discussing the methods of keeping people out of business.

Q. (By Mr. Kennedy.) The Standard people say the cutting is generally commenced by the independent people. A. They know better.

Q. (By Mr. Ratchford.) That is the reason I asked the question. They make the broad statement that they never cut except to meet a cut. A. They know better. Whenever they know your oil is on the way to a particular market they will cut the price before you get there. I have shipped oil to places—started it unknown to them, I thought; but, as in the instance I gave you this morning, they knew what I was going to do before I did; and they went ahead and reduced the price before I got my oil to the point

ABSORPTION OF PIPE LINES AND REFINERIES BY THE STANDARD.

(The witness reads from his pamphlet.)

"Soon after it induced Scott, of the Pennsylvania Railroad, to surrender the oil traffic in exchange for western freights, under a general apportionment of freights between the trunk lines. By this means was diverted a greater part of the refining trade from Pittsburg and from the oil regions of Pennsylvania to Cleveland, Ohio. It then bought a controlling interest in the United Pipe Lines."

Now, that is in answer to Mr. Farquhar's question. At this time they came in and purchased from the Vandergrift people, who were formerly the United Pipe Line. They purchased from them, as you will see, all this oil production of their lines.

"The United Pipe Lines Association moved forward steadily. It bought or combined the Oil City, Antwerp, Union, Karns, Grant, Conduit, Relief, Pennsylvania, Clarion and McKean divisions of the American Transfer, Prentice, Olean, Union Oil Company's at Clarendon, McCalmont at Cherry Grove and smaller lines, covering the oil region from Allegheny to Butler. Then followed at different intervals an association with the other pipe lines, the purchase of the Columbia Conduit Company, of Pittsburg, the purchase of all the Titusville independent refiners, who were forced to sell; the Titusville Daily Herald, Bradford Daily Era, and the Oil City Derrick, which were subsidised and then purchased; the purchase of the Union Oil Company's pipe lines in the Stoneham field."

I may say right here the Standard Oil Company are not entitled to the credit for building these lines. The leading lines were built by individuals before they came in. They were simply absorbers.

Q. (By Mr. Phillips.) It was built to the seaboard, was it? A. It had the credit of building the first seaboard line, which is outside of the Standard, "the securing of the control of the Tidewater Pipe Line, and of its dependent refineries and of its associated Western Transportation Line, and the purchase of the Pittsburg Pipe Line and its dependent refineries.

EXTRAVAGANT PRICES PAID FOR LINES AND SERVICES.

Now turn to the following history on page 57:

"At some time during the progress of these purchases, the reorganization on the trust basis, formerly referred to, was effected. The sum of all these purchases amounted to millions of dollars. All, or nearly all of them were made at prices grossly in excess of the reasonable value of the material and business sold, the chief consideration being the absorption and accumulation of power, which the monopoly was thereby acquiring. From time to time new persons were taken into this association. As Mr. Dodd, solicitor for the Standard Oil Trust, said in his argument in 1888, or rather in the history of the Standard Oil Trust: 'Whenever, and wherever, a man showed himself skillful and useful in any branch of the business he was sought after.' It has paid salaries, fees, and bonuses with imperial prodigality, some for services, some for keeping out of competition, and some for keeping still.

HOW THE STANDARD USES THE RAILROADS.

"Its methods of business are in fine harmony with the manner of its growth. It has divided the Whole United States into 'oil consuming districts.' It goes to a distributing railroad company in the west and says: 'If you will receive and carry oil exclusively for me, I will furnish your whole distributing area, but if you receive and carry any oil of any other refiner or shipper I shall have to create in your district such destructive competition as will ruin your rates."

That has been done, and can be proved by a thousand witnesses.

"Where there are competing roads it gets their managers together and shows them how it can supply them with all the oil they can distribute, so apportioned between them as to maintain rates on a non-competitive basis. It never breaks a promise when that promise conveys a threat. If, therefore, it fails to make such exclusive arrangement in any district, and an independent refiner is admitted therein as a shipper on equal terms, it forthwith ignores all freight rates and all values, puts the price of oil to the consumer below the original cost, and keeps it there until it drives the independent refiner out of the district."

Q. (By Mr. Kennedy.) When Mr. Archbold was on the stand the other day he submitted to the commission letters from a large number of railroad managers of the United States stating that they gave no favors to the Standard Oil Company, and that the Standard Oil Company asked for none. Now, that is the evidence that they put in. You make this statement here. Can you give the commission any evidence aside from your word that this was done? A. I am prepared to answer in full the documents in my statement.

Q. These letters referred to the period since the passage of the interstate commerce law. A. Yes; I do not know anything about that, but I do know that they have paid them right along.

Q. Since the passage of the interstate commerce law? A. Yes; and I will prove it was paid up to last January.

Q. To the Standard Oil Company? A. I say rebates are paid. Very well. They are not only shippers of oil, but perhaps behind everything else, as I have stated before.

Q. If you have it in order, I will withdraw my question.

THE STANDARD MAKES ITS GREATEST PROFITS IN AMERICA—THE INDEPENDENTS COULD NOT LIVE WITHOUT THE FOREIGN TRADE.

Q. (By Mr. Phillips.) You can proceed in your own way.

"It then dictates its terms to the railroad. Where it thus secures exclusion, it establishes and maintains a price to the consumer without the least regard for general market values, as high as the conditions will warrant" (that I can prove); "and where such exclusion is not established, as low as will be necessary to exterminate the competitor. There are exclusive districts where refined oil is sold at more than $40 per barrel, and there are contested districts where it has been sold as low as $1.25 per barrel. As all the export oil must be sold in Europe in competition with the Russian production, the profits are normal. The revenues of the Standard are, therefore, chiefly made between the American producer and the American consumer."

Q. (By Mr. Kennedy.) I think it was given in evidence by some gentleman representing your side of

this question that your business was not profitable until you secured the European field—the German and English fields. That seems to be a little at variance with your statement there. A. It is the only field we were never shut out of.

Q. (By Mr. Phillips.) Could you or could you not refine oil here without selling export oil? Is that not really essential? A. Certainly; I have shown you that the quality is not used in this country that is sold in Europe.

Q. (By Mr. Kennedy.) You say here the Standard Oil Company makes profits chiefly between the American consumer and the producer. Now, your people have testified that you have a profit in this foreign market. Therefore, if you have a profit and can sell in competition with the Standard, they must have a profit there, too? A. Certainly they have. I have stated that since the German government says there must be no unfair trading there has been no particular cutting of prices. That is the situation exactly.

THE STANDARD IS ABLE TO KEEP COMPETITORS OUT OF NEARLY ALL DOMESTIC MARKETS.

Q. (By Mr. Phillips.) Do you undertake, then, to state that the opposition are making more out of the American trade than the independents are? A. I simply say it is an impossibility for me to ship oil even to the Mississippi River and compete with the Standard Oil Company. I can not go to the coast at all, and there are a hundred and one accounts I can recall to prove my assertion. What I mean to say is that I can not even go to Elmira and sell in competition with the Standard Oil Company, a distance of 143 miles from my factory. I do not sell there; I do not sell to the nearest town.

Q. Why do you not? A. Because this war is created at once.

Q. (By Mr. Farquhar.) Competition starts in? A. That is right; but it goes on just as it did in Philadelphia, away below the cost of the commodity. There I lost $54,000 and then I quit. I gave it over to the Pure Oil Company and it is there yet—all my horses, all my wagons. I have gone out of the outside business. I can not do business—that is all there is about it. Seventy per cent. of my product goes to Europe now. I make very largely lubricating oils and wax. The Bradford oil is one that does not yield very heavily in water whites; therefore I have got to send my commodities to Europe.

COMPETITION LEADS BOTH SIDES TO CUT PRICES; BUT THE STANDARD DOES NOT ALLOW ANY COMPETITION TO APPEAR WITHOUT WAR—AMOUNT HANDLED BY INDEPENDENTS.

Q. When you are going into the field, do you start to sell below the Standard rates? A. No; we attempt to maintain rates.

Q. And the cutting comes sometimes from the Standard and sometimes from you? A. Certainly it does; because we go into a market, and the astute merchant says, "I am not going to buy from you. I will buy from the Standard Oil Company." What will you do? Of course you will reduce prices. But we do not go into the market. We only handle about 3,000,000 barrels a year all told out of 23,000,000 produced. Only about 3,000,000 barrels of it is not handled by the Standard Oil Company.

Q. (By Mr. A. L. Harris.) If your competition does not exceed 10 per cent of the trade at a given point, do they pay any attention to it? A. Yes; if we go in with a car load of oil that is quite sufficient to create a war.

OIL CHEAPER IN EUROPE THAN IN AMERICA, BECAUSE OF REGULAR COMPETITION.

Q. (By Mr. Farquhar.) Oil for oil, quality for quality, does the European consumer get oils cheaper than the American? A. Yes.

Q. How much cheaper? A. I can not give you the percentage. In Europe today I should say that oil of this quality is 25 per cent cheaper than the same quality is sold on the average in this country.

Q. Now, does that arise from the competition of the Russian oil with the American product? A. It arises from the fact that we are in these markets as competitors, and Russia is there as a competitor. The competition unquestionably brings that market down.

Q. But the independents and the Standard Oil Company sell at about the same rates in Europe? A. Yes.

Q. And you have got to meet Russian competition. A. No. The Russians sell very low compared with the Americans. They had rather have American oil at one-half cent advance than Russian. It goes farther, no bad smell about it, it is good oil. They must come in and pick up what they can find, and they do; but the distribution of the Russian goods is very small, indeed.

THE AVERAGE PRICE IN AMERICA IS HIGH, THOUGH THE PRICE IS VERY LOW WHERE THE STANDARD MEETS A COMPETITOR—THE STANDARD TRIED THE SAME POLICY IN GERMANY.

Q. (By Mr. Kennedy.) There is one point about this that I cannot understand. Some witness testified that your business was not profitable until you secured the German market. Now you sell the oil cheaper to Germans than in this country by 25 per cent? A. I do say that. It has been a good deal more than that at times.

Q. (By Mr. A. L. Harris.) Why is that? Is it because the government does not permit cut rates to the extent of destruction? A. No; I do not know that that is it, but until we got firmly established in the business over in Europe there was a determination that we should not go there, and they commenced the same tactics in that country as in this. They sold oil, for instance, on the Rhine at a cent or two cents or half a cent a gallon cheaper than they did at points where we were not present. In other words, in an adjoining district it would be higher than in the district where we were. Then, again, if they were obliged to cut prices, perhaps below cost, on the

Rhine, they would levy tribute upon the people on the Elbe to make up what they lost here. When I sold oil in Philadelphia as low as three cents a gallon it was selling in New York, 100 miles away, at eight cents.

Q. (By Mr. Farquhar.) Would not you have done the same? Was it not a good policy on the part of the Standard, where they had no competition in Germany, and knew they could sell at 25 per cent. less than they could in the American market, to hold these places there where there was no competition and to keep up prices there? Is not that good in any business? A. That was not the case until that competition came in.

Q. But where they had no competition would they not very naturally get 25 per cent more if they could to gain as many points as they could on the 25 per cent? A. Certainly; I would hold the price as long as I could, but I would not put it beyond a reasonable price. If you had competition in this country you would get oil, at least on an average, 50 per cent. cheaper.

PRICE AND QUALITY OF OIL AND GASOLINE IN CALIFORNIA.

In the state of California, where I have bought oil, I have gone to the markets and paid, in cans, 20 cents a gallon; and the same oil I was sending out of my factory and glad to get 4½ cents for it.

Q. (By Mr. Clarke.) Put up in the same way? A. Yes. I have gone to Valley Springs, California, and bought gasoline that was marked on the head "Double deodorized gasoline," and paid 25 cents a gallon for it; and when I paid that I was selling those goods by hundreds of barrels a day at my factory at four cents.

Q. What was the proper charge for transportation? A. I do not know. The charge on oil from the Atlantic to the Pacific is 75 cents a hundred. Now, who knows anything about what the Standard Oil Company pays? I do not. They may pay $1.25 or 50 cents or 25 cents.

Q. (By Mr. Phillips.) If they paid the same as others, what would be the cost? A. I suppose the goods were worth about four or five cents at the refinery. If freight is 75 cents, that would be about 5¾ cents a gallon, call it, if you choose, 6½ cents, with the probable leakage and loss. It should be sold on that coast today with a good profit at 10 or 12 cents a gallon.

Q. (By Mr. Farquhar.) By the case or at retail? A. By the case. I have given the outside limit.

Q. (By Mr. Phillips.) How much did you pay at retail? A. Twenty cents.

Q. (By Mr. Farquhar.) Do you know what profit the retailer made out of this? A. I do not know what the profit was to him, but I do know I paid 25 cents for gasoline, double deodorized, and when I opened it up it was made from Lima benzine. Now, double deodorized gasoline is absolutely like ether. You can take a smell of it and it will make you drunk in 10 minutes. But one snuff of that would knock you down.

Q. So you can not tell us what the middle man made on this deal at all? A. The quality of the goods in America is not as it is in Germany, because the inspector of this oil does not do his duty. I could make charges here that I could prove that would make your hair stand, but I am not going to do it. It is not within your province, I suppose, to know anything of this kind.

THE WITNESS CAN COMPETE WITH THE STANDARD IF HE CAN HAVE EQUAL RAILROAD RATES.

Q. (By Mr. A. L. Harris.) Do I understand, then, that it is the matter of transportation that prevents your competing in this country with the Standard Oil Company as you compete with them in foreign countries? A. That is exactly it, and that is all there is to it. If this government can know and will know what the railroad's manifest is and its charges attached thereto for freight, and will see that there is fair competition in the market, I ask no odds of the Standard Oil Company. I can manufacture just as cheap as they can, in spite of their assertions.

Q. (By Mr. Phillips.) And as good? A. As good as they can. They have got nothing better in any of their works than I have got in mine, except it be, perhaps, in their fine laboratories, in the manufacture of residuums or the by-products. We raise no question about that. The whole question is the question of transportation. If you will force the railroads to obey the law, you will have cured this evil.

PAYMENT OF REBATES HAS BEEN PROVED TO HAVE CONTINUED TO 1893, THE STATEMENT OF GREAT RAILROAD MANAGERS NOTWITHSTANDING.

Q. (By Mr. Farquhar.) That brings the commission face to face with this matter. You make the assertion, and so have others, in regard to rebates. The Standard Oil Company comes forward with the letters of 20 great railroad managers, and we can neither verify your statements nor discredit the statements of these managers. A. I will put you so you have got to say one or the other.

Q. The commission comes to a stone wall there if we do not have verification. A. Unfortunately my secretary has not brought up important documents that I should have here in this case; but I trust you will rely implicitly on my statements in what I am going to say, because it is my own case that I am going to bring before this committee. It is the case of Logan, Emery & Weaver vs. The Pennsylvania Railroad Company. Here is an abstract from the records of McKean county, from the appellants' docket, No. 130, December term, 1887. It is the case of A. H. Logan, Lewis Emery, jr., and W. R. Weaver, partners under the firm name of Logan, Emery & Weaver vs. The Pennsylvania Railroad Company.

Q. (By Mr. Clarke.) Let me inquire if the case grew out of the alleged discrimination before the passage of the interstate commerce law? A. Yes, it did; but the discrimination lasted after the adoption of the law, and a suit was brought for rebates or difference in freight up to 1888. In the settlement of the

case it was agreed between the Pennsylvania Railroad and ourselves that no further suits would be brought because they paid a certain sum of money to me to settle the case. The rebates existed after 1887, and I have the testimoney to produce, if necessary, of the fact. I will produce the testimony here, part of it taken in the same case, showing that rebates were paid up to 1888. In April, 1887, the interstate commerce law went into effect.

Q. (By Mr. Farquhar.) There has never been a question before this commission about rebates and discrimination before the passage of the interstate commerce law. It is conceded that the old trouble, the wildcatting system of making freights, existed up to 1889, two years after the passage of the act. There are plenty of cases there on file now showing that rebates have been issued. A. Yes, there is a case in which I am interested now before the interstate commerce commission in which we have proven rebates to 1893.

TESTIMONY OF HIGH RAILROAD OFFICERS CONTRADICTED BY SUBORDINATES.

I desire to present to this coimmssion a document filed with the court in McKean county, February 17, 1890, and also an order from the court, a rule for taking testimony. I should be glad to have you examine this document to see that it was filed with the court, because there is very important testimony in it relating to transportation, and that you may be able to identify it in the future. In this suit, of which I have a transcript here from the document, which is subscribed by the county clerk, prothonotary, George W. Mitchell, we called to the stand George B. Roberts, president of the Pennsylvania Railroad, and the question was asked him if his road paid rebates on the transportation of oil.

Q .(By Mr. Phillips.) At what time? A. This was in 1890, when the suit was tried. The rebates that we claimed were paid to January 1, 1888. He replied: "No rebates are paid by our railroad on the transportation of oil." He was asked the question in various ways, and he said he knew nothing of any rebates; that was against the policy of his road. John S. Wilson, the general freight agent of the road, was put on the stand. He said positively that no rebates had been paid on their road since the suits of 1879 upon petroleum. He said: "As general freight agent of this road I should know, and I give my oath that no rebates were paid." The auditor of the road, Mr. Taylor or Mr. Justis, I do not know which, one was the auditor and the other assistant auditor, said that rebates had been paid, and if I had my books here I could read you when they were paid and under what conditions. The next called was Mr. Justis, I believe, and he corroborated Mr. Taylor that rebates had been paid on the Pennsylvania road. This testimony was taken before a master.

Q. (By Mr. Clarke.) Can it be produced? A. Oh, yes, I have the testimony. I have sent for it. Mr. Roberts was examined in the court, but I have not his testimony here. The next man that was called in the case was the bookkeeper, Mr. Thayer, who had stood at one desk, he said, 26 years, keeping accounts in a certain department. He was asked whether rebates had been paid to any shippers of oil over the road, and he said they had. We called a large number of witnesses.

Q. (By Mr. Phillips.) What were the rebates? A. The rebates ran from eight cents a barrel to 28 cents a barrel. Under the anti-discrimination law of Pennsylvania the penalty prescribed was three times the damages, to be collected of the man proved guilty. A large amount of our shipments of crude oil from the oil regions to Philadelphia, where Logan, Emery & Weaver owned a refinery, at what is called Greenwich Point, on the Delaware, were shipped from Olean, N. Y. When we came into court with our evidence, exceptions were taken to that part of our claim which related to shipments from the state of New York on the ground that interstate shipments could not be considered under the state law.

DIFFICULTY OF GETTING RAILROAD PEOPLE TO APPEAR AND TO ANSWER QUESTIONS.

We commenced this suit early in 1887, and it was not concluded until 1890. The railroad people were able at will to send word to the master that they could not come today, but would come some other time. We traveled with our attorneys 500 miles, simply to go home again. We were bandied about for nearly three years in taking that evidence. It was expensive; it was annoying; but the court had no power, it seemed, to compel these people to come to the stand. When we got them to the stand certain questions were propounded which they refused to answer under the advice of counsel—the screen which all these criminals of this country who are against its laws and the rights of the people get under, "We can not answer that question because it may incriminate us." They would not even attend the court in McKean county, and the judge issued a bench warrant and sent the constable to Philadelphia and brought Mr. George B. Roberts and Mr. Green and Mr. Downey and others to the bar of justice.

PROPOSITION TO SETTLE THE SUIT OF LOGAN, EMERY & WEAVER.

When they got up into the county of McKean my partner said to me: "There is a proposition to settle this case." I did not want to settle. I wanted to fight the thing out. We had compelled the Pennsylvania Railroad to bring their books, and there were three tons of them that they had to bring upon the train to answer the summons of the court. We were more than a year in getting those books into court. Now they were cornered up, and we had absolute proof of eight to 28 cents a barrel rebates that had been paid.

THE WITNESS HAD BUILT HIS PHILADELPHIA REFINERY AT THE SOLICITATION OF THE RAILROAD, BUT THE RAILROAD DROVE HIM OUT OF BUSINESS.

I went to Philadelphia to manufacture oil in 1880 at the instance of the railroad officials themselves. They had a little bit of a quarrel with the Standard Oil Com-

pany after the close of the suits of 1879—Commonwealth vs. Pennsylvania Railroad. They invited the refiners to meet them and I went there at their own solicitation and built those works. I ran them from 1881, when I built them, up to 1887; but the railroad practically drove me out of business there.

SETTLEMENT OF LOGAN, EMERY & WEAVER SUIT.

Their attorney came to our attorney and said: "We will give you $35,000 to quit, and expenses of the suit." My partners had become discouraged and disgusted. We took the money. We did not go on with the interstate commerce suit, because we knew we should never get through. I entered one suit here in the interstate commerce commission and it was seven years before I got a decision.

Q. What was the amount of your claims? A. My claim was $107,000. A great portion of that was on shipments of oil from the state of New York. If I had gone on with the suit I could have secured a large sum of money, but I had not the heart to do it. I was not able to do it. My finances were such that I could not spare the money to go into court and overcome the dilatory tactics of the railroad officials. I simply dropped the case in disgust. I took the $35,000 and they paid the costs of the suit.

R. B. CAMPBELL'S TESTIMONY AS TO PAYMENT OF REBATES UP TO JULY 1, 1888.

This is a document of the court of McKean county. It is only a few words I wish to read to you. It is the testimony of B. B. Campbell. Perhaps I had better read, as I can not leave this with the commission. Anything I have read, or in fact, the whole testimony or a copy of the testimony in this suit, I can give you if you would like it.

"B. B. Campbell in the suit of Logan, Emery & Weaver vs. Pennsylvania Railroad Company.

"B. B. Campbell being first duly sworn, testified as follows in answer to questions by Mr. Lee:

"Q. You were sworn in this case and testified before? A. Yes.

"Q. And certain questions you declined to answer under advice of counsel? A. Yes.

"Q. You received certain allowances on freight shipped over the Pennsylvania Railroad. From what place and by whom was that freight shipped?

"(The counsel for defendant objected to the question in the manner in which it is put, for it is assuming the fact that he did. Second, the form of the question is bad.)

"You may state whether you received any allowance on freight shipped by the Bear Creek Refining Company, limited, over the Pennsylvania Railroad, and from what point that freight was shipped, and to what points. A. Those matters are fully stated in my answer to the question propounded me under a rule of court. The freight from the Bear Creek Oil Refining Company was shipped from Coleman station on the Allegheny Valley railroad as far as the junction and from the junction I believe to Bolivar over the West Penn, and from thence mostly to Philadelphia; some few shipments were made to Communipaw and some few to Bolivar. There was some little local trade, but the great majority were shipments of export oil to Philadelphia.

"Q. During what period were these allowances made to you? A. That is fully stated in my answers to the court, which were, of course, made up and fully stated from October 1, 1884, until July 1, 1888."

A year and four months after the interstate commerce act went into effect.

"Q. You may give the allowances by the year. A. They are already given. From October 1 to September 30, 1885, the rebates were $8,607.51; until September 30, 1886, $10,313.47; until September 30, 1887, $15,200; until July 1, 1888, $13,980.15; total received, $48,101.13."

Q. (By Mr. Clarke.) Nearly all of that was before the passage of the interstate commerce law? A. Yes. There was a year and a half of that time after the passage of the law.

Q. The last item given there is the only one which comes in since the passage of the interstate commerce law, is it not? A. No. The interstate commerce law took effect in April, 1887. During the year from September 30, 1886, to September 30, 1887, rebates were paid amounting to $15,200.

Q. From April to September after the law? A. And all of the last item. We knew that these same rebates were continued up to this time, and therefore the bringing of our second suit, which was settled for the $35,000. So we dropped the whole thing.

OTHER SUITS AGAINST THE PENNSYLVANIA RAILROAD ON ACCOUNT OF DISCRIMINATIONS.

Now I desire to further fortify this statement. After this suit was decided a great number of suits were brought against the Pennsylvania Railroad. There was the Independent Refinery, of Oil City; S. Y. Ramage, of Crown Oak, Pa.; the Germania Refining Company, the Continental Refining Company, the American Oil Company, of Titusville; Rice, Robinson & Fogin, of Titusville; the Seneca Oil Works, of Warren; the Corn Planter, of Warren. All of these companies brought suits against the Pennsylvania Railroad and other roads. This is a dispatch I received today. I had other memoranda of this suit, but I wanted to be able to state definitely upon this question, so I sent another telegram yesterday and find it recorded. Of course the court record of these suits can be produced to the commission; but I make affidavit here that this is true and correct to the best of my knowledge and belief. The refiners' claims (this is addressed to myself, care of the industrial commission —refiners' claims were filed with Rogers Sherman (he was also a witness against the Pennsylvania) up-to August 1, 1888 (which was contemporaneous, I think, with this I have read: "Compromise and settlement agreed"—that is to say they compromised these suits and took their money. The amount collected at that time by these several refineries, as I recollect it, was about $84,000. I may be mistaken; it may have been a good deal more, or it may be less.

Q. (By Mr. Clarke.) Were those suits all settled by the railroad companies? A. Yes; by the Pennsylvania. "Claims therefore filed with the interstate commerce commission."

DECISION OF THE INTERSTATE COMMERCE COMMISSION BASED ON PAYMENT OF REBATES UP TO 1893.

Q. How far does that go back? A. They settled up to August, 1888, and from August, 1888, up to 1893 the interstate commerce commission has rendered a decision that the railroads are responsible to these refineries for $86,000.

Q. Is that decision reported in their annual report? A. Yes. You will find it in that case. The railroads have refused to pay this $86,000, and it has gone to the circuit court of the United States at Pittsburg. The suit is now pending for the collection of this money. I want to clinch this thing right here, and I am going to do it by reading you a letter.

THE RECEIVERS OF THE BALTIMORE AND OHIO PROPOSE TO MAINTAIN THEIR PUBLISHED RATES AFTER JANUARY 1, 1899.

"Late open public confessions from the receivers of the Baltimore and Ohio Railroad of secret rates, drawbacks, rebates and other devices."

Q. (By Mr. Farquhar.) What are you reading from? A. I am reading from a letter addressed to the interstate commerce commission by the receivers of the Baltimore and Ohio railroad.

Q. (By Mr. Phillips.) Under what date? A. December 22, 1898.

Q. 1898? A. 1898, less than a year ago. (Reading:) "Will maintain rates. Baltimore and Ohio railroad adopts a new policy."

Q. (By Mr. Farquhar.) Who is the author of the letter? A. It is a letter that was published some short time ago. It is a public matter. I do not know who published it.

Q. Who is the authority for the letter? A. Why, Mr. Cowen.

Q. Mr. Cowen of the Baltimore and Ohio? A. Yes.

Q. He signs this letter A. To the interstate commerce commission; yes.

Q. That is what we are looking for. I want to know the author. A. (Reading:) "Receivers Cowen and Murray addressed a letter to the interstate commerce commission stating their purpose to adhere to published tariffs and to report to the commission, in lieu of other agency, the failure of other roads to do the same.

"Chairman Knapp, of the interstate commerce commission, has received a letter from Receivers Cowen and Murray, of the Baltimore and Ohio railroad announcing that after January 1 that railroad will maintain scrupulously the published tariff and rates filed with the commission, and will appeal to the commission for aid in cases coming to their attention of railroads failing to maintain rates to the detriment of their interests. This step is an important one, which will interest largely all other railroads. What the attitude of other roads will be is unknown here. The letter in full is as follows:

" 'Within the territory north of the Ohio River and east of the Mississippi the railroad carriers are transporting the larger part of the interstate traffic at rates less than those shown in the published tariff filed with your commission, which are by statute the only lawful rates.

" 'While this condition continues there will exist the unjust discriminations and the unjust preferences and advantages between persons, localities and particular descriptions of traffic, the prevention of which is the main object of the act of congress establishing your commission. Only by securing the uniform charging of the published rates can the just equality of service and of charge required by law be secured either between persons or between localities.

NO AGENCY FOR RESTRAINT.

" 'Heretofore the Baltimore and Ohio Railroad Company and its competitors within the territory above mentioned have maintained joint agencies or associations under various agreements intended to act as a restraint upon each carrier and to prevent the secret cutting of rates on competitive traffic. It has been the practice for each carrier to report to a joint agency or association any departure from the published rates by a competing carrier, to the end that the facts might be fully ascertained and the unfair competition stopped.

" 'The supreme court of the United States has now fully determined the so-called anti-trust act applies to railroad carriers and in legal effect prohibits any agreement between them which restrains competition in any degree, even though such agreement goes no further than to secure the observance of the restraints imposed by the act to regulate commerce. It is therefore no longer lawful for the carriers to create by agreement between them joint agencies or associations as formerly to prevent the cutting of rates, however unlawful. Without some impartial body to investigate the complaints of one competing carrier against another and to check illegal rate cutting, if found to exist, it will be practically impossible for the railroad carrier alone to prevent that form of competition between them, however earnest the great majority of the carriers may be to stop it.

" 'The interstate commerce commission not only commands the respect of the railroad carriers for its impartiality, but also in its powers to investigate complaints of illegal rate cutting and to put a stop to all illegal practices far surpasses any association which the carriers have ever created by agreements between themselves.

TO SEEK AID OF COMMISSION.

" 'We see no reason why the commission should refuse its aid to the carriers in an effort to prevent competition from taking the form of illegal concessions through secret rates, drawbacks, and other devices; and we see no reason why the carriers should not seek the aid of the commission in such an effort by reporting to the commission any departure from published rates,

to the end that the facts may be fully ascertained and the illegal practice stopped.

"'The receivers of the Baltimore and Ohio Railroad Company will maintain, on and after January 1, 1899, upon the lines operated by them, the rates, fares, and charges shown on the tariffs published and filed with the commission as required by law."

After that day; a practical admission that they have not previous to that time; put your own conclusion on it. (Reading:)

"'We believe that all, or nearly all of the railroad carriers within the territory above mentioned, will likewise maintain their published rates from that date."

Referring to the fact that they did not. (Reading:)

"'To prevent a relapse, however, to the conditions now existing, it is necessary that no important carrier shall long depart from the published tariff rates. Should such a departure occur, to the detriment of the interests in our charge, we shall invoke the aid of the commission to stop it. We hope and believe that many other carriers will do the same. In the anticipation that the other railroad formerly associated with the Baltimore and Ohio Railroad Company in traffic associations will adopt the course decided on by us and above outlined, we have taken the liberty of transmitting to each such carrier a copy of this letter."

Q. (By Mr. Ratchford.) Is that letter the original? Is that letter signed by the receivers of the Baltimore and Ohio? A. It is on file; I suppose it must be; it is on file in the Interstate Commerce Commission. Now, gentlemen, there is an absolute admission on the part of the Baltimore and Ohio Railroad that rebates, drawbacks, and other devices have taken place up to January, 1899.

Q. (By Mr. Clarke.) Have you any evidence that connects that with the business of the Standard Oil Company? A. Oh, no. These discriminations are not upon oil, but they are upon the tonnage offered by the large corporations—no question about that.

Q. (By Mr. Farquhar.) Possibly individuals, too? A. Individuals as well, possibly. That is the bane of the whole thing, these discriminating rates.

Q. Have you done with that? A. I think the commission can understand clearly from that paper that the Baltimore and Ohio have given these rebates, and they have got tired of doing it, and will obey the law.

AS TO B. B. CAMPBELL.

Q. (By Mr. Farquhar.) I would like before we leave this part of it to have presented the evidence of Mr. B. B. Campbell in respect to those rebates. Mr. Campbell was the signing party of the Standard Oil Company and the United Pipe Line? A. I do not understand.

Q. He was the signing party in respect to the suppression of all rebates and drawbacks? A. Yes.

Q. The document, as drawn up in 1880, between B. B. Campbell and the Pennsylvania Railroad Company? A. Yes.

Q. Did he turn as a witness against the railroad after he received the rebates? A. Yes. He could not help himself; he kept out of our way for a long time.

Q. Then Mr. Campbell himself was the signer of the original agreement between the railroad and the Standard and all the other producers? A. No.

Q. Well, it is testimony here; I have evidence here taken by the Bacon committee. A. But when I come to explain to you before I complete this argument, I will answer all those questions.

Whereupon at 5 p. m. the commission adjourned until 10 o'clock tomorrow morning.

Washington, D. C.,

Tuesday, September 12, 1899—a. m.

The commission was called to order at 10.30, Mr. Phillips presiding.

Lewis Emery, Jr., again on the stand and examination resumed.

Q. (By Mr. Phillips.) You can resume your testimony and proceed in your own way. A. You only let me get to 1872, yesterday, and then you hurried me on to 1889 and 1899.

REPORT OF EXECUTIVE COMMITTEE OF PETROLEUM PRODUCERS' UNION, 1872—THE FIRST RUMOR OF THE NEW POWER.

I got up to the South Improvement contract yesterday, and I showed you its repeal. I read from a public document as follows (reading): "History of the rise and fall of the South Improvement Company. Report of the executive committee of the Petroleum Producers' Union, embracing the report of the subcommittees or transportation, legislation, investigation, and treasurer's report, at Oil City, Pa., 1872.

"On February 20, 1872, rumors were rife in business circles that the railroads, having their main lines or feeders extending into the oil regions, had formed a joint arrangement to advance the freights on crude and refined oils from the fields of production to the seaboard.

"With a production of 16,000 barrels of oil per day, and the coming of spring, which always brings renewed energy to operation, and an already depressed market, this rumor created the greatest uneasiness in the minds of all operators and shippers. Nothing definite could be ascertained, and nothing further than the rumor could be heard, and the region settled back to fancied security.

"In a few days, however, a second rumor was circulated, that not the railroads, but a company bearing the wonderfully inappropriate cognomen of the South Improvement Company had purcheased a right to all petroleum transportation, and were to arrange the rates of shipment of all the oil produced, and that an immediate advance of 50 per cent was but the first advance, with promise of more in the future.

THE ADVANCE OF FREIGHT RATES—PROTESTS AND STRUGGLES.

"This, however, seemed so quixotic that it did not meet with general credence until it was confirmed by telegram on the 26th from railroad officials to their

agents at shipping points in the oil regions advising them of the new rates, to take effect immediately. An advance of 100 per cent on all freight charges, on crude and refined, was equivalent to a complete paralysis of all operations for and in oil in the entire region. But oil men are made of sterner stuff than to tamely submit to so gross an outrage, let it come from what quarter it would.

"The thousands of operators were electrified with indignation, and rose as one man to defy and resist the levying of a tribute so palpably unjust. Meetings were called in all the principal towns and cities. The honor of calling and organizing the first meeting is conceded to Tidioute. E. E. Clapp was elected to the chair, and resolutions indicative of the spirit and determination of the producers of that field were passed. It was resolved, *inter alia*, to shut down all their wells until the old rates were restored, or until a new outlet could be found to remove their oil to outside markets, if such steps were necessary.

"Delegates were also chosen to attend a mass meeting called to assemble at Titusville on the evening of the 27th, 'to consider the necessity of constructing a railroad from Erie, by the way of Titusville, into the oil regions, as a competing railroad, connecting with water communication to New York and Europe, and such other business of interest to the people as might come before the meeting.'

"The meeting at Titusville demonstrated the fact that the wealth, determination, spirit, and practical ability of the men of the oil regions would render victory for them in the battle with monopoly an absolute uncertainty.

"The wonderful resources of oil men, when pressed by great difficulties, here became apparent in the plans and suggestions laid before the meeting. Railroad routes, with suggestions and estimates of cost, to reach the lakes on the north and railroads not in the combination on the south, pipe lines, and other remedies were suggested, and the feasibility of some, if not all, did much to reassure the mass of people that they would speedily find a solution of the difficulty."

THE SOUTH IMPROVEMENT COMPANY—THE REPEAL OF ITS CHARTER WAS OF NO PRACTICAL EFFECT.

I read so much only to show the spirit aroused at the time of the first notice of the formation of the South Improvement Company. Now, if you will turn to page 15 of my pamphlet, you will find an act to repeal the charter of the South Improvement Company. But on page 15½ I have shown how a charter in the very same terms was bought by the National Transit Company, which is one of the companies of the Standard Oil Trust. Clement A. Griscomb was president of the National Transit Company; he is not at this moment. He is a director of the Pennsylvania Railroad. I have explained to you from my book of the demoralized condition of trade, at the time when the South Improvement Company act was repealed, through this tremendous pressure on the rairoads on the part of this South Improvement Company. You will see that all this work was done between these two northern trunk lines of railroads and the Pennsylvania in the south was repealed by this act. I propose to show that, though the contract was annuled, the South Improvement contract, as well as the contract between the Standard Oil Company and the railroads, the annullment was never lived up to, and the business of the country proceeded just exactly as though the South Improvement Company was in full force. If you will please turn to page 48 (see Fiftieth Congress, first session, House Reports, vol. 9, pp. 361, 362) [reading]:

THE RAILROADS AGREE THAT THERE SHALL BE NO DISCRIMINATIONS OR REBATES.

Agreement Between Railroads and the Petroleum Trade, Executed the 25th of March, 1872.

That all arrangements for the transportation of oil after this date shall be upon a basis of perfect equality to all shippers, producers and refiners, and that no rebates, drawbacks, or other arrangements of any character shall be made or allowed that will give any party the slightest difference in rates or discrimination of any character whatever.

That the present rates from Oil City, Union, Corry, Irvineton, Pittsburg, Cleveland, and other competing points shall be and remain in full force at following rates:

ON REFINED OIL, BENZINE, ETC.

	Per bbl.
From Oil City, Union, Corry and Irvineton, to—	
Boston	$1.65
New York	1.50
Baltimore	1.35
Philadelphia	1.35
From Cleveland to—	
Boston	1.65
New York	1.50
Philadelphia	1.35
Baltimore	1.35
From Pittsburg to—	
New York	1.50
Philadelphia	1.35
Baltimore	1.35

On Crude Oil.

From Oil City, Union, Corry and Irvineton to—	
Boston	1.50
New York	1.35
Philadelphia	1.20
Baltimore	1.20
Cleveland	.50
Pittsburg	.50

And said rates shall not be liable to any change, either for increase or decrease, without first giving to William Hasson, president of the Producers' Union, at Oil City, at least 90 days' notice in writing of such contemplated change.

In the distribution of cars for shipments, it shall be done without discrimination.

On the basis as hereinbefore stated, the parties respectively agree to carry out the arrangements in good faith, and work for the mutual interests of each other.

In witness whereof the parties have hereunto affixed their signatures this 25th day of March, A. D. 1872.

For the Lake Shore & Michigan Southern Railroad Company, H. F. Clark, president; for the Erie Railroad Company, O. H. P. Archer, vice president; for the New York Central & Hudson River Railroad Company, William H. Vanderbilt, vice president; for the Atlantic & Great Western Railroad Company, George B. McClellan, president; for the Pennsylvania Railroad Company, Thomas A. Scott, vice president. On behalf of the producers and refiners: G. Shamburg, E. G. Patterson, William Hasson, Henry Byrom, William Parker, John J. Fisher, Oil City producers and refiners; J. J. Vandergrift, A. P. Bennett, William M. Irish, William T. Scheide, Oil City producers and refiners; Henry N. Rogers, F. C. Fleming, Josiah Lombard, Jr., New York refiners; B. Vaughan, Boston refiners.

Q. (By Mr. Phillips.) Is that the same Mr. Rogers who testified before us? Is it a mistake in the print, or is it a different man? A. I do not know whether this is the man. This is in the year 1874; but I think Mr. Archbold and Mr. Rogers did not go into the Standard Oil Company until 1875. I do not know whether it is the same or not. It does not make any difference. These gentlemen stood on the rostrum with me three or four years fighting this very principle.

Q. Did he have a refinery on Oil Creek? A. Yes; he did.

Q. (By Mr. Farquhar.) This Rogers had a New York refinery. This is another Rogers; it is H. N. A. Yes; I think you are right. Page 51 (reading):

THE OPEN RATES RAISED AGAIN.

[The New York Central & Hudson River Railroad Company, General Freight Agent's Office, Grand Central Depot.]

New York, September 9, 1874.

Dear Sir: Commencing October 1, 1874, the following rates on refined and crude oil shall govern all lines:

The rates on refined oil from all refineries at Cleveland, Titusville and elsewhere in and adjacent to the oil region shall be as follows:

	Per bbl.
To Boston	$2.10
To Philadelphia	1.85
To Baltimore	1.85
To New York	2.00

Net rate on Albany 15 per cent less, from which shall be refunded the amount paid for the transportation of crude oil by rail from the mouth of the pipes to the said refineries, upon the basis of 14 barrels of crude oil to the refineries for every 10 barrels of refined oil forwarded by rail from them (the refineries) to the eastern points named.

Settlements of this drawback to be made on refined oil forwarded during each month.

No rebate on these rates will be paid on oil reaching refineries direct by pipes.

On crude oil the rates from all points of rail shipments in the oil region shall be as follows:

	Per bbl.
To Boston	$1.75
To New York (net rate on Albany 15 per cent less)	1.50
To Philadelphia	1.50
To Baltimore	1.50

From which shall be refunded 22 cents per barrel only on oil coming from pipes which maintain the agreed rates of pipage.

A barrel shall in all cases be computed at 45 gallons.

You will observe that under this system the rate is even and fair to all parties, preventing one locality taking advantage of its neighbor by reason of some alleged or real facility it may possess.

Oil refiners and shippers have asked the roads from time to time to make all rates even and they would be satisfied.

This scheme does it, and we trust will work satisfactorily to all.

Respectfully, yours,

J. H. Rutter,
General Freight Agent.

THE AGREEMENT THAT THERE SHOULD BE NO DISCRIMINATION WAS NOT KEPT TWO WEEKS.

The date of that contract was the 25th day of March, 1872. I tried to get yesterday a copy of the Hepburn report, but I could not. But in 1879 George R. Blanchard, the present manager, I think, of the Central Traffic Association (am I right-), of Chicago, was called to the stand by the Hepburn committee. You all know what that was—a committee of the New York legislature. He swore that this contract that I have just read, which is so soundly and so fairly worded, was not respected two weeks. I put that in as a part of my evidence, and I refer you to the Hepburn committee—that this agreement, solemnly drawn and signed by the railroads, that I have raised a question about in my testimony here before you, was abrogated within two weeks after it was signed, according to the testimony of George R. Blanchard. Does the commission want me to go into the fact and prove rebates and drawbacks from the date of this contract up to 1877?

Q. (By Mr. Clarke.) My understanding is that these rebates and drawbacks are conceded by the railroad companies and the Standard Oil Company up to the passage of the interstate commerce act. If that is so, it is not at all necessary. A. I can produce every contract.

REBATES PAID ONLY TO MEMBERS OF THE STANDARD OR THE SOUTH IMPROVEMENT COMPANY.

Q. (By Mr. Farquhar.) In that matter of 1880, which concerns the agreement of the Producers' Union, would you have had that agreement at all unless they had made rebates and discriminations from 1872 up to 1880? It is conceded that in all the arrangements the rebates were payable from 1870 up to 1880. A. To whom?

Q. To all parties. A. No.

Q. Well? A. Only to those connected with the Standard Trust or the South Improvement Company. If you were not a member of that organization, you could not participate in the drawbacks.

Q. But that agreement or purchase which was entered into afterwards, in 1880; Mr. Campbell was president of the Producers' Union at that time? A. Now, you are getting too far; I will come to that.

Q. Oh, I understand that. A. I will give you the whole history; but I want to know whether you want me to prove to this commission that rebates were paid from 1872 to 1887, when the business became an absolute monopoly; when the Pennsylvania Railroad surrendered everything over to the Standard Oil Trust?

MAY NOT THE EMINENT GENTLEMEN WHO SAY THE STANDARD HAS RECEIVED NO REBATES FOR TWELVE YEARS BE MISTAKEN?

Q. (By Mr. Kennedy.) The other commissioners have said that there was no question about the practice of paying rebates before the passage of the interstate commerce law. Since then there is some question, and it seems to me that the issue shapes up in this way: The Standard Oil Company people have come here and sworn that they have not asked nor received rebates since the passage of that act. They say they were too shining a mark under that act to get or ask for rebates. All they desired was that they hold up the published rates and hold others to them. Now, it seems to me the thing for you to do, if you can do it, is to prove that they have taken rebates since that time. If you do that you can convict somebody of perjury. A. I think that it is clearly proved that rebates were paid. Mr. Roberts, president of the Pennsylvania Railroad, went upon the stand in the court of common pleas of McKean county and testified that his railroad had not paid rebates from the time the interstate commerce law took effect. Mr. John S. Wilson, whose testimony I have read, the general freight agent, corroborated Mr. Roberts. I have here the testimony in all these cases, and the witness of a hundred men, proving that Mr. Roberts and Mr. John S. Wilson were mistaken in their statements. You say that you have letters here filed by Mr. Archbold from honorable men representing the several railroads of the country. I have no doubt of their honesty. I have no right to even cast a reflection upon Mr. Archbold or upon his testimony, but I do venture to say that if Mr. George B. Roberts, president of the Pennsylvania Railroad at that time, now deceased, and Mr. John S. Wilson, its general freight agent, will come upon the stand and make oath that no rebates have been paid since the interstate commerce law took effect, and following their testimony the auditors and bookkeepers of the road go upon the stand and swear that rebates have been paid, and we prove from 8 to 28 cents a barrel, and my claim is settled, and I receive my $35,000 and costs of the suit, may not these gentlemen who have written these letters be mistaken? I would like to see their auditors and bookkeepers put upon the stand, as we put those of the Pennsylvania Railroad. We did not get this information until we brought their books into court. When they saw they were in a corner, they surrendered. I told you that out of a production of 23,000,000 barrels of oil a year the outsiders handle, I think, not over 3,000,000 barrels altogether, including the fields of Ohio, West Virginia, New York, and Pennsylvania. And do you think if these small men, handling this small quantity of oil, go into the courts and prove rebates from April 4, 1887, when the interstate commerce act took effect, up to August, 1888, as we did in my own suit, and then bring suit before the Interstate Commerce Commission for rebates from that time up to 1893, and the Interstate Commerce Commission render a verdict of $86,000 against the railroad; if these men of the Standard Oil Company, with their ability, as one of the witnesses has stated, or through their great competency, through their great brain, have carried oil to the ends of the earth as nobody else could, do you think for one moment that the Standard Oil Company would allow those small men, who have not the brains or the ability, to beat them on the transportation?

UNFAIR FREIGHT RATES, DISCRIMINATING FREIGHT RATES, CAUSE ALL OUR COMPLAINT AND TROUBLE.

Bring into the courts of this land the books of these railroads. They are responsible to-day not only for the acts of the Standard Oil Company, but for the oppressive monopolies in every line of business. Go to the stock exchange, where members are levied upon a dollar a head upon every cargo that came from the Western country. Go to the produce exchange, where they were levied upon barrels of flour that came from the Western fields. The interior mills of the country are paralyzed because of this unjust discrimination; I am a miller, and I make 500 barrels of flour a day. All these trusts, I say, are built up at the instance of the railroads; and I make the broad charge that had they obeyed the law and given equal rights to all shippers there would have been no trusts. There would not have been the dissatisfaction in the country. Go to Duluth, if you choose, to-day, and try to buy a carload of coal that you wish to take out into North Dakota, where I have a wheat farm. The coal is mined by the miners at from 35 to 50 cents a ton, drawn to Buffalo, I think, at a dollar, and loaded on the ship at cost, as I understand, of less

than $1.75. Allow 75 cents for transporting it to Duluth and you have $2.50. Three hundred and thirty-four miles from Duluth, by the Great Northern road, where my farm lies, west of Grand Forks 16 miles, bituminous coal is sold at $6 and $7 a ton. I say that the discrimination is the result of the coal combination, and the railroads are responsible for it.

ENFORCE THE LAW AGAINST GREAT LAW BREAKERS AS WELL AS SMALL.

The milk in the cocoanut of the success of the Standard Oil Company is transportation; unfair, illegal discriminations in transportation. Do you think that you can not prove rebates upon oil if you call the witnesses, with books and papers? The Pennsylvania Railroad had rather pay $200,000 than permit me, or allow Logan, Emery & Weaver, and the court, to look over that three tons of books that were brought up to the court house in McKean county. It would have sent them to prison. The injustice in this country is that a poor devil goes along the street and steals a loaf of bread when he is hungry, and he is arrested and taken to the courts and sent up for 10 or 15 days. If he steals a coat to keep his body warm he is sent to prison for a year. These great corporations, the men managing them, come into court and say "We won't bring out our books; we won't answer your questions; because if we do we shall incriminate ourselves." There is the difficulty. The Sherman Act—the Federal Act—has been proved constitutional by the highest tribunal in this land, and if it was enforced these people would go to prison. You can prove it, Mr. Chairman and Commissioners, if you choose; it is in your power to prove discriminations, I believe, to this moment, if there is any truth in the letter of Mr. Cowen and Mr. Murray.

REFINERIES ABSORBED OR WRECKED BY THE STANDARD.

Please turn to page 78 of my pamphlet, where you will find a list of refineries bought, leased, squeezed out, or bankrupted by the Standard. The list is taken from my testimony before the Committee on Manufactures in 1888. (Fiftieth Congress, first session, House Reports, vol. 9, pp. 232,233.)

In this list there are some refineries that went out of business in 1867. I do not charge their going out of business to the South Improvement contract entered into by the railways; they went out previous to that. But you come up to 1870 and 1871, when some refiners had very large rebates, and others very small ones, or none at all. As I said yesterday, the Standard Oil Company have no patent on rebates. These same railroads have been violating the law ever since they were created, by giving rebates and drawbacks; but never so much, previous to 1872, that the average business man could not stand up under them. He could not make as much money as his neighbor, and he used to wonder why; and when this exposure came he learned the reason. But the contract of the South Improvement Company, and the very large rebate, the 100 per cent rebate, given to the Standard companies, was the means of driving most of these refiners out of business. Now, then, these refiners were, most of them, in existence at the time of the South Improvement Company, 1872, a contemporaneous date. I have read to you this morning the repeal of the South Improvement Company charter. I have read to you the fair contract between the producers and refiners and the Standard Oil Company and the railroads. I have also said to you that the contract was violated within two weeks, according to the evidence of George R. Blanchard, formerly, and now, perhaps, the Central Traffic Association manager.

WHY REFINERS FAILED—TESTIMONY OF FRANK ROCKEFELLER.

The rebates from 1872, that are said to have gone out of existence practically, were so great that the business of the average refiner was silenced. I want to read to you from the evidence of Frank Rockefeller, whose testimony was given before the congressional committee, July 7, 1876. I read from clause L.

"Q. Do you know how many refineries there were in Pittsburg prior to this alleged combination? A. I have been told that there were sixty odd refineries.

"Q. How many are there now? A. I was told by the same parties that there were now less than twenty, and very few doing any business.

"Q. (By Mr. Reagan.) What is the cause of that reduction in the number of refiners? A. I suppose the main cause has been the fact that they could not make money. I have understood that the same lever was brought to bear upon them as upon the Cleveland refiners. We had in Cleveland at one time about thirty establishments, but the South Improvement Company was formed and the Cleveland companies were told that if they didn't sell their property to them it would be valueless; that there was a combination of railroad and oil men; that they would buy all they could, and that all they didn't buy would be totally valueless, because they would be unable to compete with the Southern Improvement Company, and the result was that out of the thirty there were only four or five that didn't sell.

"Q. From whom was that information received? A. From the officers of the Standard Oil Company. They made no bones about it at all. They said: 'If you don't sell your property to us it will be valueless, because we have got advantages with the railroads.'

"Q. Give the names. A. J. D. Rockefeller, H. M. Flagler and O. H. Payne.

"Q. (By Mr. Ross.) Mr. Payne is the son of a member of Congress of that name? A. Yes, sir.

"Q. Have you heard these gentlemen say what you have stated? A. I have heard Rockefeller and Flagler say so; other parties have told me that Payne had used the same argument with them.

"Q. What other parties? A. I won't give the

names now. There are some 20 men in Cleveland who sold out under the fright, and almost any of them would tell you that story.

"Q. Give us the names of some of those that sold out? A. J. W. Faucett, of Cleveland; W. C. Scofield, Joseph Stanley, John Critchley. Those are some of them.

"Q. (By Mr. Dunnell.) Do you make the same statement with regard to the shipment of crude oil to the seaboard that you do with regard to the shipment of refined oil? A. We do no business of that kind."

If you will refer to my pamphlet, page 82 (or to Fiftieth Congress, first session, House Reports, vol. 9, p. 234), you will find that in Pittsburg there were 58 refineries in 1877. Thirty refineries had been crushed out and dismantled and no record left. The 28 were what were running and what was left.

O. (By Mr. Phillips.) What date? A. 1877. The remaining 28 had been bought or leased by the great monopoly.

RAILROAD OFFICIALS STOCKHOLDERS IN THE STANDARD.

I do not read now from the same book, but it is the same testimony and it is in the same book, but I can find it quicker in this one. (Reading):

"Q. You spoke a while ago of having personal knowledge of certain railroad officials having been stockholders in the Standard Oil Company. How do you know that? A. I know it from the officers of the Standard Company telling me that they were stockholders.

"Q. Who are they? A. William H. Vanderbilt, vice president of the New York Central, was at one time, also Amasa Stone, of Cleveland, and I have very good reason for believing, though I do not know, that Mr. Devereaux and Mr. Newell, both stockholders at the present time. Mr. Stone sold his stock some two years ago; at the time when he quit the railroad he put the stock on the Cleveland market, and is not, I believe, a stockholder to-day.

THE OIL POOL—THE QUESTION WHO GOT THE REBATES?

"Q. (By the Chairman.) Give us the names of the officials of the railroad that you think received the benefit of this rebate. A. Understand me; I do not say that they did get it. It is merely my opinion.

"Q. Give us the names of the gentlemen who you think do reap the benefit of that rebate. A. I think that Dr. Devereaux gets it, and that Mr. Newell gets it; that Tom Scott gets it, and that Mr. Vanderbilt gets it, and other officers of those roads whose names are not in my mind at present.

"Q. What do you mean by a pool—a pool among the railroads or among the oil men? A. I do not give this as a positive fact, but as I understand the argument, I understand the New York Central, the Erie, the Atlantic & Great Western, the Pennsylvania Railroad, the Cleveland, Columbus & Cincinnati, and the Baltimore & Ohio railroads had a pool or combination for the purpose of shipping oil, and oil only, and in this pool the Baltimore & Ohio gets a certain number of barrels to go over its road; the Lake Shore has so many to go over its road; the Pennsylvania got so many to go over its road from different points in the country, but on oil shipped over these roads by the pool to the Standard Oil Company there is a rebate or drawback from the shipment of so much, which is paid into this pool, over whichever road the oil may go, and the rebate is divided up between the Standard Oil Company and the railroad officials.

"Q. The railroad officials, do you say: A. So I understand it; I do not say that of my own knowledge.

"Q. Then it does not go to the railroads themselves? A. No, sir.

"Q. But to the railroad officials? A. To the railroad officials; yes, sir.

"Q. How do you think it stands related to Cleveland? A. We should do the same as we have done in the past years and are doing at the present time. We are shipping our oil at the present time by lake and canal because we cannot ship by rail without losing money; by lake and canal we can just save ourselves."

This was testimony in 1876, and the contract that I have read was taken October 1, 1874. Have you any doubt of rebate (after this evidence of these men) existing between 1872 and 1876? Why, I could read you volumes upon it.

LATER RATES—THE WITNESS COLLECTED REBATES UP TO 1893.

Q. (By Mr. Ratchford.) I want to remind the witness that if he seeks to prove before this commission that rebates were paid 22 or 23 years ago, his testimony avails very little; what we want to know whether these rebates have been paid last year or the year before. You are wasting your time in endeavoring to prove something of little consequence. I do not understand the Standard Oil Company has disclaimed discriminations in their favor prior to the passage of the interstate commerce law. I would ask that in order to make your testimony effective and to say the most in the least time possible, you confine yourself to recent years. A. That is what I asked yesterday morning, whether the question was to be taken up from the beginning, and I understood the object was to trace it from the beginning. The witness on the stand stated that no rebates were paid. I was endeavoring to show that contracts were still in existence and I was about to—

Q. If these contracts are still in existence, as you observe, will you make a point—— A. I do not mean to say they are in existence except by rebates and the methods of carrying out—

Q. (By Mr. Phillips.) He stated yesterday that the National Transit Company was organized under precisely the same language as the South Improvement Company, and he is tracing it on from that. A. I beg the pardon of the gentleman and the commission, but I was simply following out that which I was asked to do.

Q. (By Mr. Livingston.) Do you lay down the proposition now that that contract is binding and is being enforced? A. No.

Q. How long since it expired? A. It was supposed to expire two weeks after it was made, so far as the fair rates were concerned, the agreement between all the railroads in this combination to accept the rebate system entirely, and get the opportunity to go on as it had done in former years. I am trying to show you that from that time up to the present time these rebates were participated in, I do not say by the Standard Oil Company, but I do say that we have collected them on oil we shipped, and I suppose they have on theirs.

Q. How lately did you collect any rebates? A. Up to 1893.

Q. That is the way to get at it? A. I stated it yesterday; I gave the evidence in full yesterday, and produced the papers that rebates had been paid and acknowledged up to 1893.

Q. (By Mr. Ratchford.) The point is this: what is the use of going beyond 1893? A. I do not want to if you do not want me to.

Q. (By Mr. Kennedy.) These rebates ordered paid in 1893 were for oil carried when? A. From 1888 up to 1893, because we got judgment up to 1888 in the courts of Warren county, and the balance was carried into the Interstate Commerce Commission.

Q. (By Representative Livingston.) It was made incumbent on this commission by Congress to learn, if possible, whether by combinations, trusts, or corporations, legitimate competition was interfered with or lessened in any of these industrial pursuits. I want to know if you have any testimony that will lead up to the fact that the railroads, as you asserted yesterday, are largely to blame for this discrimination in favor of one oil company or against another? A. I did not say that. I said that the Standard Oil Company under these former contracts had had rebates, and I said that, though some of these contracts had been anulled, their provisions are practically carried out, and I cited instances where the trade is being affected at the present time.

Q. I want that testimony explicit, if you have it, before you get through with your testimony.

Mr. Phillips. The Senator will proceed in his own way and come to that at the proper time.

HOW THE STANDARD GREW IN SEVEN YEARS FROM FOUR PER CENT. OF THE REFINING CAPACITY OF THE COUNTRY TO 90 OR 95 PER CENT.

A. More than 95 per cent of the refineries that existed in 1872 were driven to the wall before 1877. I can give you the proof of it, but I will make that bald statement. I proved yesterday, by the testimony of Mr. H. M. Flagler, that the Standard Oil Company was formed in 1870 in Ohio. I also proved that in 1872 W. H. Vanderbilt and other railroad magnates became stockholders of it. I also proved that rebates had been paid, and I am prepared to prove that they were paid up to 1879. The testimony was taken before the Bacon committee of 1888. First, Mr. H. M. Flagler swore (Fiftieth Congress, first session, House Reports, vol. 9, p. 288) they had a capacity of 600 barrels per day of crude oil in their refinery, the production at that time being about 16,000 barrels a day. That would give them 4 per cent of the refining capacity at that time. At that time there existed in the oil country, spread out from Louisville, Ky., to Portland, Me., more than 250 refineries. Mr. Henry H. Rogers and Jabez H. Bostwick, deceased, members of the Standard trust, swore, in 1879, before the Hepburn committee, that they owned 90 to 95 per cent of the oil industry of America; that is, its refining capacity. Bear in mind that in 1870 and 1871 they owned four per cent, and in the brief space of seven years they silenced the fires in 95 per cent of the refineries, except their own. The history is here. You ought to have it. Every man ought to read it and know the method by which they accomplished that feat of throttling that great industry from 1872 to 1879.

Q. (By Mr. Phillips.) Do you desire that that shall be put in the record, so it shall be before the commission?

Q. (By Mr. Livingston.) Let him state in his own way how they did that in 1870. A. My own way is simply the record of this book—the Commonwealth vs. the Pennsylvania Railroad Company, a suit which was for three years being tried and the testimony being taken.

Q. Can you state in a few words how it was? A. Discrimination.

Q. What particular method? A. No different method; only what I have explained; the railroads paid it to them.

Q. If the railroads were guilty of this, tell us how they did it; in the form of rebates? A. Certainly. For instance, a man owned a refinery or several refineries in the oil country; at the beginning of the business the Standard Oil Company did not have any. They gave a rebate to the men that owned the pipe lines of 22 cents a barrel for all oil loaded upon the cars on the railroad. The man that owned a refinery on the creek and owned his own pipe line was not permitted to have that rebate. There was 22 cents against him right there.

Q. That was one of the methods by which they drove them out of the business? A. Certainly. How could you do business against 22 cents profit? The 22 cents alone would have driven them out; but in addition to that, they got 49 cents more.

Q. How? A. Transportation by the railroad and under agreements. That is the way they got from four per cent of the oil industry in 1871 to 90 or 95 per cent in 1879, and the whole country was silenced.

IT WAS NOT TO BENEFIT THEIR STOCKHOLDERS THAT THE RAILROADS MADE ALLIANCES WITH THE STANDARD.

Q. What did the Standard Oil Company give the railroads for doing that for them? A. I have just

read Mr. Rockefeller's testimony and he gives the names of the men. He said the railroads did not get it. I read you his evidence; take it for what you choose. He was driven out of the business. Out of the fifty odd refineries in Cleveland, 20 remained and they were owned by the Standard Oil Company.

Q. Well, you do not mean to say that the railroads lose that 49 and 22 cents? They recoup somewhere? A. I mean to say the stockholders did not participate in it.

Q. The stockholders lost it? A. I can answer that question; that there were times when there were rebates of 40 cents a barrel; there were times when there were rebates of $1.32 a barrel—rebates paid to these people not only on crude but on refined as well, not only on their oil but on all the oil anybody else shipped.

Q. Now, then, as the stockholders evidently lost that, as you stated—. A. I do not know.

Q. Where did the money go? Where could it go? A. Well, they may have spent it for wine or may have bought a farm—I do not know anything about it.

Q. You have no evidence to show where it went? A. No more than the testimony that was taken before Congress, which shows where it went.

Q. What does the evidence say? A. I can take Mr. Rockefeller's testimony. It gives the whole history, and he is not the only witness. I read this morning that Mr. Vanderbilt got some of it and Mr. Devereaux got some of it.

THE WITNESS WAS TWICE FORCED OUT OF BUSINESS BY RAILROAD DISCRIMINATIONS.

Q. (By Mr. Kennedy.) I would like to have you state to this commission how you disposed of your different refineries. What became of them? You had one in Crawford county, I believe, and one later in Philadelphia. A. Undoubtedly some one has told you I sold out to the Standard?

Q. No; I have no such information as that. A. In Titusville, Pa., the Octave Oil Company had about 800 barrels capacity—eight hundred to a thousand—when the Standard Oil Company was formed. We were invited to come into the Standard Oil Company. We were told that if we would go in we should be allowed quite a large amount of money for our refinery, taken in stock of the company—no money. No money was used in forming this octopus from the start. They only had a capital of $1,000,000 and the system was merely to turn the crank and make stock and take it from your pocket. The contract was presented to our company and it seemed to us illegal and not right, and we refused to go in. We attempted to do business the rest of 1872. These rebates I have named here were against us, although the South Improvement contract had been repealed. We struggled along until the latter part of 1873, and had to quit—shut down our refinery. It cost us $85,000 and I think we got $45,000 for it. We were forced out.

Q. Was that dismantled? A. That ran for two or three years and it was finally dismantled. The oil industry was at one time located in the vicinity of Oil Creek, or at least 95 per cent. of the manufactured product of oil was in the State of Pennsylvania at one time, and at the coast harbor at New York and in Philadelphia, but the whole country has been depleted except some in Pennsylvania belonging to the independents—demolished.

Q. I asked you about the other one. A. The other one is in Philadelphia.

Q. Is that dismantled? A. Yes.

Q. (By Mr. Phillips.) When was that established? A. It was built in 1880 or 1881, and built at the solicitation of the Pennsylvania Railroad, after the close of the suits of 1879, in which they said they were going to do better; but discrimination again drove us out, which I have shown to you in this mass of evidence. I proved there was, on every barrel of oil I shipped to that port and about that works, a discrimination of from eight to 28 cents a barrel. Who could do business against it?

CARS WERE REFUSED FOR CARRYING THE WITNESS' OIL.

I owned a pipe line in my country, from my wells and other wells down to the railroad, and they refused to furnish me cars. The Pennsylvania Railroad owned 1,126 cars—tank cars, bulk cars. I used them for a time, until the order came from the Standard Oil trust that I must get no more oil. Previous to this time they had been delivering my oil. The evidence all shows it, and there is the whole history right before you in that very book you refer to.

Q. (By Mr. Farquhar.) A good deal of your own business is right here? A. It is all there.

Q. (By Mr. Phillips.) You will make that a part of your evidence here? A. Anything you want to use as evidence, use it, and anything you want to cut out, cut out.

Q. (By Mr. Kennedy.) What became of your Philadelphia refinery? A. It was sold to the Standard Oil Company.

Q. Was it dismantled? A. It was torn down. Another refinery close by, an investment of $4,000,000, that is gone—torn down.

Q. (By Mr. Ratchford.) Did they buy it to dismantle it, as far as you know? A. They undoubtedly did.

Q. Dismantling took place soon after the sale, did it? A. Within a year. These cars were sent off into Colorado, Louisiana, and all over the country. A requisition was made for these cars and every one sent out of the state excepting 248, by absolute count. I sent three men in different directions to know what became of the cars so quickly and to make reports back to me. Well, the oil commenced to come into my tanks so that I could not do anything with it, and my property was put into the hands of the Producers' Protective Association, because they wanted me to shut down my wells. I had a large production at that time—2,700 barrels a day—and I was blocked in it. With a great big refinery in Philadelphia and a railroad running through my land, I could not get a single car. Mr. Merchants, of the Rochester and Pittsburg railroad, told me I could not, and it is in evidence: "They are going to take our coal traffic away from us if I draw your oil." I immediately applied to the courts against the Rochester and Pittsburg railroad, and made them bring cars in, such as I could.

I got one in a week, or one in two or three weeks, or one in four weeks; but I was deviled to death, until I had to quit.

THE WITNESS HAS NOT WISHED TO COMBINE WITH THE STANDARD.

Q. (By Mr. Kennedy.) I want to say to you in all kindness that I think you have made a remark that was rather discourteous and unkind in regard to somebody having told me that you entered the office of the Standard Oil Company in order to see them about buying your property. When Mr. Archbold was on the stand he did tell about other people having gone to the Standard Oil Company to enter a combination with them, but your name was not mentioned, and I have no information that you went there at that time. A. It was brought up in 1888, and ever since I have had to face a charge that I was groping around trying to sell to the Standard Oil Company.

Q. (By Representative Livingston.) Do you not think that you had good cause to go around to sell if you could sell? A. Well, I did not want to.

Q. I should have sold a long time since. A. I would not. I have stuck to my text. I do not like it; it is gross violation of rights.

Q. It is a question of sentiment with you principally? A. No; it is a question of principle. I can not afford this—not now. I may if this thing keeps on—in 10 years or longer, if God permits me life. I will go in the face of the law and protect my own rights if necessary.

NO BITTERNESS IN PENNSYLVANIA ON ACCOUNT OF THE REMOVAL OF REFINERIES.

Q. (By Mr. Farquhar.) In this matter of the Standard Oil Company buying up refineries and dismantling them or demolishing them, has it not been in Pennsylvania for a great many years quite an irritating subject with a great many of the smaller places there that they were abolishing these refineries and the trade passing away from this section? Has it not caused an imbitterment on the part of the people where the local refineries had been established and were then taken away? Is it not a common saying in Pennsylvania, as against the Standard, that they have changed the business from the Pennsylvania field to New York? Has not this caused an immense amount of hatred, bias and vituperation toward the Standard Oil Company? A. No.

Q. You say no? A. No.

Q. In your own former testimony did you not speak of the complaint of the Pennsylvanians that Pennsylvania, and especially Pittsburg, had been robbed of the legitimate work that belonged to it; that the whole labor of refining had been swept out of the state of Pennsylvania, wages had been taken away from Pennsylvania and had been taken down to New York by the pipe lines? A. Since that time Pennsylvania has got more refining capacity than in those days. Philadelphia is one of the largest manufacturing centers. They themselves have come back to Pennsylvania and built up the most enormous works. That was not the condition when this testimony was given, but in these times it is different.

PENNSYLVANIA IS THE BEST PLACE FOR REFINING OIL.

Q. I am glad to know that. Now, as a refiner and business man, do you not think there were legitimate reasons why a good deal of the refining might better be done in New York, especially in view of the by-products that came into general use, than it could have been in scattered districts in Pennsylvania? A. No; and I will tell you why.

Q. So you think the representatives of the Standard Oil Company were incorrect when they testified before this commission that it was purely a business matter, and not a matter of prejudice, that they had dismantled this business in Pennsylvania and Ohio and substantially done the work in New York? A. No; that is entirely wrong. They are mistaken in the answer to that question, from the very fact that they have come back here today and are manufacturing by-products very largely. They have come back there because fuel is cheap; because natural gas is there in large quantities. There is an abundance of most excellent water, and I believe today they are sorry that every single refinery they have is not located somewhere in Pennsylvania. They have come back there and spent millions and millions of money in Pennsylvania since they made that excuse, that it was not the proper place to refine oil.

Q. (By Mr. Phillips.) You were about to go into the discriminations up to the time of the passage of the interstate commerce law? A. Yes; I have figured the matter up to 1899.

Q. Then will you oblige the commission by taking it up to that time? A. I have no further evidence.

Q. You have already covered that ground, you think? A. I have given enough. I have some other matters where rebates are collected.

Q. Then are you ready for questions in regard to the formation of these recent companies, pipe lines, etc., at this time? A. Yes.

THE WITNESS DETERMINED IN 1890 TO UNDERTAKE A PIPE LINE TO THE COAST.

Q. It has been charged here that you and others are connected with a trust in various pipe lines in the oil country—the Pure Oil Company. Will you oblige the commission by explaining that? A. In 1890, in the latter part of the year, owing to the high rates of freight over the railroads, the transportation of our refined and crude oil was so expensive that personally I determined to build a pipe line to the Atlantic coast if possible. In a secretive way, as everything had to be done then and has to be done now, I placed in the field some 20 expert right of way men to secure the right of way for a pipe line.

NEGOTIATIONS WITH THE READING—"WE SHALL DISTURB OUR RELATIONS WITH THE STANDARD.

I knew very well that it would be impossible for us to go clear through to the coast with a line, and I went

to Philadelphia and saw Mr. McLeod, the president of the Reading railroad.

I presented my question to him with a proposition that we would get the pipe, the right of way, to Williamsport, and there connect with the Reading railroad, and with a right to lay our pipe line, for a time, as we could build it, on a right of way of the railroad. I told him the amount of tonnage that we would give him, and made preliminary arrangements, and he said to me: "You return after a time." I did; I was alone; nobody knew anything about what I was going to do. I met Mr. McLeod and Mr. John Taylor, the general manager, and Lowry Brill, the general freight agent. Lowry Brill is now on the New Jersey Central. All these gentlemen came into the room. And by the way, there was one other man; I do not remember his name; anyway, all the chief officials of the road. I had to reduce my proposition to writing. The rate of freight was agreed upon and the basis of a contract was put in form, and I was to return at their dispatch when they were ready. I never got the dispatch. I returned and took with me some other gentlemen from the office, and I said: "What is the reason of this?" And they said: "If we give you this contract we shall disturb our relations with the Standard Oil trust, and we can not do it;" and I was dismissed.

NEGOTIATIONS WITH THE NEW YORK, ONTARIO AND WESTERN.

From there I went to New York and had a conference with the members of the Columbia Oil Company of New York, Mr. King and Mr. McDonald, they being independent refiners of the coast. I laid the matter before them, and we went from there to the office of the New York, Ontario and Western railroad, which runs from Oswego, N. Y., to New York city. We then concluded, Bradford being just here [indicating on map], to follow the boundary line of Pennsylvania bordering on New York, to a place called Hancock, N. Y., where the Erie railroad crosses the Delaware and into the small city or village of Hancock, and across to the New York, Ontario and Western railroad, it being to the north of the Erie railroad about one mile.

THE STANDARD TAKES AN INTEREST IN RIGHTS OF WAY.

Our men secured this right of way through the state without very much opposition, because the Standard Oil trust had not got onto our movements. Finally it became known; and all at once came in a number of men who were very anxious to build a line right exactly where we were building one, although the Standard trust owned a line right parallel with the state line, back a little in the country, running clear through to New York city. They did not need the line, because lying in the ditch were two parallel lines running from the oil country, from Olean, to New York; but they did not want us to build a line, and these men, as set forth in this pamphlet, came along and took up rights of way on top of our rights of way. They went to the records of the several counties and examined the titles to the land that we had got the rights of way through; and if there were mortgages against these properties they bought the mortgages. The owner was in debt for the place and if he overstepped his rights in law by holding that mortgage they induced that man to give them another right of way. In the state of New York, beyond the state line, we had about six miles to go down to the Delaware river; and they came along and bought strips of land right across our right of way in Pennsylvania—strips of land from a mile to a mile and a half long—throwing us into the courts in every instance where they could.

NEGOTIATIONS WITH THE ERIE.

Before we started to lay our pipe line I went to the Erie railroad office in New York and saw Mr. George M. Thomas—the president of the road, I think he was at that time. I met Mr. Thomas, a perfect stranger to me, and I told him what we wanted to do. We wanted the right to go under the Erie railroad at Bradford. "Why," he said, "certainly you can go under the railroad with your pipe." "Well," said I, "we are going down to Hancock and we want to cross your railroad or pass under it, either in the deep water of the Delaware or else through the bank of the road, with our pipe." "Well," he said, "we are disposed to assist all progress, and I will take that under advisement, and you can come back here in two weeks. But you go ahead and go under our road at Bradford or any other point that you can." I said that I was very glad that he received me so kindly, and that he gave me so much encouragement; that I would commence laying our line on the Ontario and Western railroad a mile north of Hancock, within the borough limits. "Well," he said, "you return and the matter will be fixed up all right." I said: "I am afraid that something will intervene, some power that will overcome you in this matter, and your views will be changed." "No, sir," said he, "the Erie railroad runs its own business and whatever I have done will be carried out; but this other matter I shall be obliged to take up in such a way that I will be certain." I then got up to go and he detained me. We discussed the question of transportation and business generally; and I went away and went to work, and worked a couple of weeks connecting our line to the Ontario and Western road; bought 11 acres of ground on which to build our storage tanks and put in the pipe.

PIPING REFINED OIL—THE STANDARD SAID IT COULD NOT BE DONE.

We laid two lines, refined and crude. That is a thing that the Standard Oil Company never did. They said it could not be done. We pump refined oil 500 miles and deliver it on board vessels in New York, and it comes out just as bright as it did at the refinery. We pump our refined oil.

Q. (By Mr. Phillips.) Do the Standard Oil Company pump theirs? A. No; they said it could not be done, although they are the inventors of everything, and are the benefactors of the world.

THE ERIE RAILROAD IS HELPFUL.

I laid that line down to the Erie bridge—the big iron bridge that crosses the Delaware—and I commenced on the other side of the bridge, 120 feet away from the upper side, or the line of the right of way, and I laid the line out toward Pennsylvania. We had had our fights over this right of way. I knew the men that were taking up these rights of way to have been in the employ of the Standard Oil Company. I knew the men personally and my men knew them. If necessary I can tell their names at this moment. We had overcome, as we thought, the obstacles, and I went back to New York to see Mr. Thomas, and he came from his inner room and took me by the hand and said: "You can go under our bridge at Hancock in the deep water if that is advisable, or in the bank," and he spoke to the general manager of the road—his name I forget; he was present at our conversation; so was Mr. King, of the Columbia Oil Company—and he said: "You wire Mr. Durr, the division superintendent of the Susquehanna division, to meet Mr. Emery at Hancock tomorrow morning and go with him to locate their oil pipes, either to go through the deep water of the Delaware or to pass through the bank of the Erie grade." I took the 9 o'clock train. This was done—the message was sent—I saw the gentleman write it. I took the 9 o'clock train, went to Hancock and got there about 2 o'clock in the morning and I immediately went to the Chandley House, near by. I was anxious to know whether Mr. Durr was there. I was afraid something would happen; but to my surprise Mr. Durr was there waiting for me. The next morning I took a carriage—my wife was with me—Mr. Durr, my wife and myself. We rode to the Delaware River, which was not half a mile away, crossed the river, it being low, sounded the water, went upon the bridge and saw where the rocks were, etc., and concluded the best thing we could do was to go through the bank. There were two ends of pipe 120 feet apart. He said: "Mr. Emery, I will make a profile of this and will have it in your office one week from today." That was to be on Thursday. I said, "All right." I went home and started our pipe, and the very first place where we had to lay the pipe was under the Erie track.

THE ERIE CEASES TO BE HELPFUL.

Q. (By Mr. Clarke.) What? A. Under the Erie railroad track. It was in the switch yard; some four tracks side by side; and it was pretty difficult to go in there. We went there, honestly supposing we had a right to do so. I had spoken to the superintendent about it and he did not know anything different. When I returned to New York previous to this time he said, "All right." We were working away with our men, and the first thing I knew down came a force of two or three handcars, and they jumped on the track and attempted to put our men out of the ditch. I was at my office uptown. They went to the nearest telephone and I went down there and they were having a contest. My refinery was close by and I ordered the whole force out and we drove off the opposition. We had what we term nowadays a "scrap." I drove them away and went on with our work.

Q. (By Mr. Phillips.) That was near Bradford, was it? A. Right in the city of Bradford. The next morning we were enjoined by the court. This was the Erie railroad that was objecting now, you understand.

Q. And was it in the state of Pennsylvania, where you had the right of eminent domain? A. Yes; I should have said that before. A letter was addressed to me by our attorney. This letter I will put in evidence, because I know all the facts.

DIFFERENT LAWYERS, REPRESENTING DIFFERENT RAILROADS, RAISE THE SAME OBJECTIONS AND SUPPORT THEM WITH THE SAME ARGUMENTS.

SEPTEMBER 8, 1889.

HON. LEWIS EMERY, JR.,
Bradford, Pa.

My Dear Mr. Emery: In reply to your inquiry am pleased to make the following statement:

The first legal opposition that we met with in constructing the line of pipe of the U. S. P. L. Co. was an attempt to prevent us from laying pipe under the track of the Erie railroad within the limits of the city of Bradford, at a point where both the National Transit Company and the Tidewater Pipe Company had previously laid their lines, and so far as can be learned, without the slightest objection on the part of the railroad company. We presented our bond and petition to the court of common pleas of McKean county and were met by attorneys on the part of the railroad objecting to the granting of the prayer of the petition and the approval of the bond. They had at the hearing a very exhaustive brief, with which they seemed to be familiar. They apologized to the court for the way in which they presented same, saying that it was prepared by Mr. Elliott, and that they had not had the time to carefully consider the same. I took very full notes of the authorities cited and of the points made by the attorneys for the railroad company.

A short time after this I had occasion to appear in the courts of Tioga county, representing the U. S. P. L. Co., in opposing a bill to restrain the company from laying a pipe under the Tioga branch of the Erie railroad. The attorneys at this hearing seemed to have the same brief as was used in the hearing in McKean county, citing the same authorities and making the same points. Later I represented the U. S. P. L. Co., presenting a petition and bond to the court of Bradford county, for the right to lay a pipe under the track of the Northern Central, at a point south of Elmira, and was again met by what appeared to be the same brief, authorities and points. The objections in all the cases were many, and the authorities cited numerous, and what seemed to me strange was the fact that in each there appeared to be the most complete harmony. It is wonderful how minds and labor of attorneys so far separated should bring out the same objections and support them by the same argument, yet so it was.

Very truly yours,

W. E. BURDICK.

THE CONTEST WITH THE ERIE AT HANCOCK.

We bought our way under every single road from there to Hancock. When we got to Hancock I knew there was something wrong. But I went with my men to connect up those two pipes, 120 feet apart, and we were met first with two derricks and two locomotives, a flatcar containing lumber and a little brass cannon that had been used for shooting holes through the tank that was run off the track, and a car holding about 75 men. The moment we came there with our men they supposed of course we were going to connect up those two pipes. They threw off the old slabs and stuff and built a sort of a cob fire over each end of the pipe. They threw off the lumber and built a house on each side of the track, and put two men in them with Winchesters. We stayed there three months looking one another in the eyes. We never got under the track. We spent $70,000.

THE NEW YORK, ONTARIO AND WESTERN VIOLATES ITS CONTRACT.

The New York, Ontario and Western were induced to violate their contract . I should state that we went by the Ontario and Western because we got a contract out of them by which they would transport our oil down to Cornwall on the Hudson, and there we were going to put it into boats and draw it down to New York and deposit it in our tanks. That contract gave us the right to construct a pipe line on the right of way to the Hudson, for which we were to pay them a royalty of two cents a barrel. We were even cut off from the contract by the same power.

MORE LEGAL CONTESTS—THE SAME BRIEF—CONTRACT WITH THE NEW JERSEY CENTRAL.

We kept a standing army there at Hancock. We went back 70 miles to the Susquehanna River and we flanked the enemy until we got down to Wilkesbarre. At Wilkesbarre we had contest after contest in passing under the tracks of the D., L. & W. and the Lehigh Valley and other roads. This same brief came into the court. Seven lawyers, representing different lines, were against us, each one reading the same brief, making the same points. We beat them, and we built our line through and we connected with the Jersey Central railroad, a friendly railroad, which had a contract with us to draw our oil for a term of 99 years, with right to cancel the contract by a certain number of months notice.

Q. Who had the right to cancel the contract, the United States Pipe Line Company or the railroad? A. The United States Pipe Line Company. We stopped there for a time because we were out of money. It cost us more than $150,000 to fight our way to that point; their keeping us from going to Hancock and the expense of going down to Wilkesbarre, litigation, loss of time and loss of our business. Then we stayed at Wilkesbarre about one and a half or two years, and we concluded we would go on. So we secured a right of way from Wilkesbarre over to a place about 30 miles above Easton. We built that line there to the river and then we went into Jersey. The first thing we had to pass under was the Pennsylvania railroad.

NO FREE PIPE LINE LAW IN NEW JERSEY—THAT OF NEW YORK HAS BEEN AMENDED AWAY.

Q. Was there a free pipe line law in the state of New Jersey? A. No.

Q. (By Mr. Kennedy.) Is there in New York? A. Yes. You want me to explain the law to you?

Q. (By Mr. Phillips.) No. A. I think I had better do that. In 1878 New York passed the first pipe line law that was passed in this country. It was passed under the same pressure as the Pennsylvania law. It was a good, free, open law, and the Pennsylvania law is copied from it. But some one in 1890, just before we got down to Hancock, went in and had that law amended, and it became absolutely inoperative.

Q. (By Mr. Kennedy.) And you can not get the right of eminent domain under it? A. You can not get the right under that. The pipe line to Buffalo was laid under the original law. It was a good law.

GOOD FORTUNE IN GETTING PAST THE PENNSYLVANIA.

We had to go under the Pennsylvania railroad. Fortunately we found one of the secretaries of the treasury of the United States who lived in Trenton—I can not think of his name now—but we searched up a title and we found that he owned an acre of land, just one acre, which was used many years ago, during revolutionary times for a wharf and a dumping place for very, very old furnaces, iron furnaces, just back there. He did not know he had it himself until we found his title. We bought it and paid $500 for it and we went under the Pennsylvania track.

Q. Did they have the right of way across this? A. Yes; but we had a title for the land. We had the title and went under there after a long contest.

TROUBLE WITH THE D., L. & W.

We got over to the D., L. & W., within the borough limits of Washington, N. J., and we bought a farm, the Stewart farm, over which the old Morris and Essex railroad passed. The charter was granted in 1836, and an easement had been bought over that land and paid for—had a deed for it. We bought the fee title of the land over which the right of way was given. Our attorney said we had a right to occupy the land. Six or eight months before that we had put in a piece of pipe to test what they were going to do, and they tore it out. So we thought we would not be beaten, and I took 50 men from our line and we went over there in the dead of the night and I placed my men on both sides of the hill. They had a watchman of the road passing up and down with a lantern in his hand, back and forth. He would come up to the culvert under which we were to pass the roadway, 14 feet high from the ground. He would look down and see that silence prevailed and go away. About four o'clock in the morning we took possession and when

9 o'clock had arrived on Sunday morning we had two pipe lines buried four feet under the earth and fastened to timbers as heavy as a span of horses could draw. We piled rocks on top of them and anchored them with chains, built a house on each side of the culvert of the right of way and took our breakfast in camp. About 12 o'clock some men came along and said: "You get out of here," and came down with their picks and bars. I was there in the pit myself and he said: "You will not get out?" And I said, "No; we belong here; it is our line and we will not disturb the railroad." He said, "You will get out; come along, boys." I said, "Don't be hasty," but he was a little hasty and I told the boys to take the men by the shoulders and the seat of the pants and take them out and lay them down carefully, which they did. On Monday morning two wrecking cars with 250 men rode in from Hoboken. They made a charge on the little band in the pit and we drove them out. That is all there is about it, we drove them out.

Q. (By Mr. Clarke.) When was this? A. This was in 1891. They wanted to compromise the matter and wanted to go to the courts, where we wanted to go. They said: "You permit our men to go into this subway, and permit them to remove some earth, and you go through the formality of arrest." I said: "All right." When we got down and they wanted to move the wagons away, off the pipe, we said no. He said: "The wagons are in the way." I said, "They are there on purpose, and I am not green enough to give you any advantage just now. The wagons will stay there. If you want to do any business of that character, go on." We arrested their men, and they arrested our men, and they wanted to know if we would go up and have the trial. So we went uptown and the sheriff had the men we wanted before the justice of the peace. Each one had his trial and was bound over to the court, and the issue was made up, and we went off to our dinner at the hotel, as I supposed, when men came rushing on horseback and said: "They're in a fight." I jumped into the first buggy I found—I did not know whose it was—and I found these traitors, who had promised to take this into court, there with two locomotives standing on top of the track hitched close together. They were running hot steam and water down into this pit on my men. They went to the fire box and threw hot coals down on them, threw stones and clubbed us; but we whipped them. I ordered every man out of the pit. I told them if they came back there I would shoot them. We barricaded ourselves and the Grand Army of the Republic gave us 48 muskets, and I sent to New York and got 18 Springfield rifles. We bound our pipes in with wire and tied them down, barricaded our house and stayed there for seven months holding possession until the court decided we had a right to stay there. The very men who are at the head of this—I knew them—the men who were there on watch were in the employ of the Tide Water and the Standard Oil Company. We are pumping oil through to the junction, after the difficulty we had in getting these rights of way through New Jersey. The very same men we found up in New York were offering as high as $5 a rod to the farmers, instead of $1.50, which is our price. The whole community turned out to help us and defended us because of the public wrong. We built that line through.

THE PIPE ENDS 50 MILES FROM NEW YORK—THE FREIGHT RATE FOR THAT DISTANCE.

Q. (By Mr. Phillips.) Through to where? A. Through to the junction, 50 miles from New York. From there we have a rate of freight; not, as was stated here by one of the witnesses on this stand, a discriminating rate. The total price, I believe, as given here for transporting a barrel of oil from the oil regions to the seaboard, by the Standard lines, was 45 cents. We pay for that 50 miles on our refined oil 7 2-10 cents, and on the crude 6½ cents. It is not by the car load, or, as stated by the witness, about $6 or $7 a car. We give them cars that hold from 132 to 150 barrels. That makes about $10 a car; a great big rate of freight for a haul of 50 miles. The road is very glad to get it. It gives them in revenue $200,000 a year.

Q. (By Mr. Clarke.) What road is that? A. The New Jersey Central, friendly to us. I commend them. No discrimination, mind you. It is a rate that is open and not a secret rate. Anybody else can come in at the same price. We pay from that point the 7 cents, if we choose to, and the 6 cents; and we compete with the Standard Oil Company in the markets wherever we have fair competition and fair railroad rates.

THE RAILROADS HAVE WON AT LAST.

We have contested this suit in the courts of New Jersey for the last four years; and now a decision has been handed down by the chancellor's court that the contention of the United States Pipe Line against the D., L. & W. railroad is not valid, and we have notice that we must take those pipes out. The railroads of this country are a barrier to any modern improvements of transportation.

Q. What was the ground of the decision; do you know? A. That they had a title, not only an easement but the title or the fee in the land, although they did not buy the fee. There were two decisions in our favor by the vice chancellors, one by Vice Chancellor Emerick and one by another—I do not recollect his name. But they were reversed. So our line has got to come out from under that road. It is doing no harm, lying in the midst of a large tunnel, or, I should have said, an open cut. And the old farmer, reserving the right, has egress and ingress to his fields on both sides. Nevertheless, the court is against us. I thought I could produce a letter by which we are given notice that we must remove those pipes immediately.

Q. What state was that? A. New Jersey.

Q. (By Mr. Phillips.) The decision of the lower court, if I understand—? A. Sustained the principle that we had title.

Q. Was reversed afterwards? A. Reversed in the chancellor's court. There is another court which is higher than that—the superior court.

Q. Has your company appealed this case? A. Oh, we have gone through with all of it. Now, then, that

is the story of attempting to stop competition in the business.

Whereupon the commission took a recess until 2:15 o'clock in the afternoon.

WASHINGTON, D. C., *Tuesday, September* 12, 1899. *P. M.*

The commission was called to order by Vice Chairman Phillips at 2:20.

Lewis Emery, jr., again on the stand and examination resumed.

Mr. Phillips. Senator Emery will now proceed with his testimony in his own way.

THE UNITED STATES PIPE LINE COMPANY; ITS VOTING TRUST—THE STANDARD BUYS STOCK IN IT.

The Witness. I desire to take up, in connection with what I was saying this morning, the subject of competition. The United States Pipe Line Company was organized with a capital originally of $600,000 and at the present time its capitalization is $2,000,000, I believe. We formed in that company a voting trust. I should say that the United States Pipe Line Company was organized under the general corporation act of the state of Pennsylvania. We formed a voting trust for the purpose of keeping the stock out of the hands of any one that was disposed to attempt to control our operations. There was at the time this trust was formed, I think, about $800,000 of the stock subscribed for and every dollar of it was in the trust. However, regardless of the provisions of this trust, the Standard Oil Company purchased at an advance on the par value, which is $100, $386,000 worth of the stock. Before they had purchased it, however, the stock taken had been increased by new subscriptions to about $1,200,000; but their expectation and attempt was to get the control of the stock. Owing to the loyalty and determination of the rest of the stockholders ,they were unable to purchase any more stock. That trust is in existence today—a voting trust. The Standard Oil Company presented themselves at one of the yearly meetings of the United States Pipe Line Company and attempted to vote that stock. We refused, by unanimous resolution of stockholders, and he was ejected from the room, out of which grew the suit of the National Transit Company and J. C. McDonald vs. the United States Pipe Line Company.

THE STANDARD GETS A DIRECTOR ON THE BOARD OF THE UNITED STATES PIPE LINE COMPANY.

Q. (By Mr. Phillips.) In what court? A. That was brought in the McKean county court and was appealed to the state supreme court, but was never heard by the supreme court. The case was not even called up. Our attorneys were notified that the appeal was illegally taken because an officer of the company had not made an affidavit to the bill of appeal, although a stockholder had made an affidavit. I was absent from home. On that ground the supreme court of the state of Pennsylvania threw it out, although we gave to the court several decisions wherein other courts had held that to offer an affidavit made by a stockholder of the company was quite sufficient for an appeal to the supreme court. This was the case. The Standard representative has since been allowed in the meetings; he has listened to the deliberations, and has been allowed to vote upon such questions as he chose to vote on, ever since they have held this stock. They still own it.

Q. Was this gentleman elected a director or not? A. He was elected by the circumstance of having this stock. We recognized him and he was elected and is a director of the company; voted in every time we elect. He knows just exactly what we are going to do, and participates in everything pertaining to the general business of the company.

Q. (By Mr. A. L. Harris.) Was he prohibited by the law of the State of Pennsylvania, or by a by-law of your company? A. From entering?

Q. From entering; from voting. A. I can answer that question later. I can not just at the moment; I can read the plea of our people, which is here. I don't know which it was. It was on some ground; we thought it to a legal ground, and we still think so. But when we were cut off by the supreme court's decision that the affidavit was improperly made, why, of course, our case failing, we could not renew it. That is all there is about it. Our attorneys denominated it a technical matter and not one of good law. I don't know anything about it.

THE INDEPENDENT REFINERIES ARE INDEPENDENT.

The stock that these people purchased in the United States Pipe Line belonged, some of it, to three of the largest refinery owners in the association of refiners. The refineries belonging to the independents have no connection with any of the stock companies. The refineries are owned by individual operators and have nothing in common with the United States Pipe Line or the Pure Oil Company, or the Producers' Oil Company, limited, or any other transportation or oil marketing company. They market their oils individually. They are competitors with one another. I go into the market and I meet there my brother refiner and I put a price upon my goods and he puts a price upon his goods. No objection; free, open competition among all these refineries that are in the field. There are today something like 15 of them, which furnish oil to the transportation companies; and we sell oil not only to the Pure Oil Company, doing business in Europe, but we sell oil to England, France, Italy and every other country, independently of the Pure Oil Company. So do not confound these refineries with what we are going to finally deal with—the trust; because they have no connection with it. They are independent; all competing against one another in the markets of the world.

Q. (By Mr. Farquhar.) Do these refiners also sell to the Standard? A. Oh, yes. I sell the Standard lots of goods, and I make them pay all I can, too, like everybody else.

REFINERIES RECENTLY BOUGHT BY THE STANDARD AND DISMANTLED.

These three gentlemen that I referred to as owning three of the largest refineries connected with this refiners' association—if you choose to call them such; they are not an association—when they sold their stock they sold their refineries as well, and they received a large sum of money for them. Within less than eight months from the purchase of these refineries by the Standard Oil Company one of them belonging to Mr. Ramage, was dismantled and destroyed. The next to be partially dismantled was that belonging to Hon. John Fertig, of Titusville, known as the National Refining Company. The next was the Continental Refining Company. All these refineries were first class and built, especially the last two, in modern times, and with every improvement; so was Mr. Ramage's; in fact, he made more by-products, etc., than any other. All these refineries have been demolished and taken from the ground where they originally stood. That has all happened since 1895.

Q. (By Mr. Phillips.) Was any effort made to buy other refineries? A. Oh yes. These people seemed to constitute themselves a committee. They labord with me, and labored with others. They said that it was the best thing to sell out and quit. The rest of us did not think so, and we are on earth yet. I should have been glad to have gentlemen who are anxious to hear about these modern things hear those representations.

THE PURE OIL COMPANY—ITS VOTING TRUST HAS BEEN MODIFIED.

Q. Now, will you explain something in regard to the Producer's Oil Company? A. The Standard Oil Company bought a majority of the stock of the Producers' Oil Company, limited. Its method of operation in purchasing that stock you have before you already. Through the same method they purchased a majority of the stock of the Pure Oil Company, limited. They have not been permitted by the courts to vote it, and it has had to go back into the hands of the original owners, if necessary, by order of court.

Q. Will you make some statement in regard to the Pure Oil Company as organized thereafter? A. The Pure Oil Company was organized under the laws of New Jersey. Its capital at present, I believe, is $2,000,000, with $377,000 paid in. We are very much afraid that when our United States Pipe Line trust expires, which will be within the next 15 months, there may be some attempt to get possession of more of that stock. We have felt the necessity of combining or putting the stock of the several companies into the hands of the Pure Oil Company and forming a voting trust, solely for the purpose of protection. I desire to say that the paper which was referred to has been amended. First, it is not a permanent voting trust. Second, three-fifths of the stock voted at any time can dissolve the trust, or can overrule the power of the voting trust. Only one-half of this stock, and 10 shares over, is put in trust, and three-fifths of the whole at any time can control the policy of the company. Under the terms of the charter it terminates within 46 years. Therefore it is not perpetual.

Q. (By Mr. Farquhar.) Is that one of the new amendments? A. Yes.

Q. (By Mr. Phillips.) Was it originally formed for over 50 years? A. No; chartered for 50 years.

Q. (By Mr. Farquhar.) The old form required four-fifths? A. Yes.

Q. Section four of section 12 (reading): "This agreement may be cancelled and the trust hereby created dissolved only by the winding up of the Pure Oil Company, or by the consent in writing, duly executed, of the equitable owners of four-fifths of the shares held in trust hereunder, and of four-fifths of all the other shares of the company, after providing in full for the redemption or purchase, at $1.10 per share, in cash, of all the preferred and common shares of the company at the time outstanding." A. Yes.

Q. Is this redemption feature still maintained, that the trust cannot be dissolved until after providing in full for redemption or purchase at $110? A. That provision is wiped out by the fact that three-fifths can control or change the by-laws, or change anything pertaining to the organization or management of the company.

Q. Well, is this stock-redemption feature still retained? A. I don't know, sir; I can't answer that question.

THE PURE OIL COMPANY IS NOT A TRUST IN THE INDUSTRIAL SENSE.

Q. Now, it has been said here that this Pure Oil Company is not a trust. I called the attention of another witness to the fact that it is specifically mentioned as a trust in your articles of agreement and also of incorporation. A. Yes.

Q. So that you are not afraid to call it a trust? A. I call it a voting trust. I will submit your question to decision, if you choose, according to the definition of a trust given by the Commercial Year Book of the New York Journal of Commerce. The definition is, "As popularly used, the word 'Trust' is now applied to any consolidation, combine, pool, or agreement of two or more naturally competing concerns, which establishes a partial or complete monopoly, in certain territory, with power to fix prices or rates in any industry. Viewed from the standpoint of the consumer, the informal agreement and the ironclad combine look alike if the one has the same effect as the other upon prices."

Now, there is nothing in the world about the Pure Oil Company that can possibly lead up to that definition. There are several other definitions that I can refer to.

Q. Let me suggest that there are five true definitions given by Mr. Cook, who is an authority, one of the greatest lawyers in the country, and also by Von Halle. There are five forms of trusts.

Q. (By Mr. Phillips.) I would ask the Senator to read the definition, under the Sherman act, of a

trust, if he has it there. A. It needs no argument to show that the Pure Oil Company is not a trust. It lacks every element of a trust. A trust is defined by the anti-trust law known as the Sherman act of 1890 as follows: "All trusts and combinations in restraint of trade are unlawful." Another accepted definition is that a corporation or combination of corporations, with vast capital, made for the purpose of securing and maintaining a monopoly in any branch of industry, is a trust. The odious feature is the aim and purpose to secure a monopoly. The Pure Oil Company was organized, not to secure a monopoly, but in aid of trade, and to maintain competition. It expires by the expiration of its charter 46 years from the 6th day of next November. It is therefore neither permanent nor perpetual as alleged. It would be silly to hold that a corporation with a paid up capital of only $377,000, opposed by a trust in the same industry with a par capital over two hundred times and a market value over one thousand times as great, could be a monopoly or restrain trade; and unless it is a monopoly, or restrains trade, it can not be a trust. That the power to vote one-half of its stock has been placed in the hands of trustees, to prevent a great monopoly from intruding to destroy it, does not change the character of the corporation or make it a trust. If the Pure Oil Company should ever develop monopolistic tendencies, the present holders would be glad to have it destroyed. If any anti-trust legislation, at any time, brings within its restrictive or destructive provisions the Pure Oil Company, the stockholders of that company will welcome its destruction.

NO EFFORT TO COMBINE WITH THE STANDARD.

Q. You are a large holder in most of these companies. You are president of the United States Pipe Line Company, and you are a large holder in the Pure Oil Company. Do you know of any effort ever having been made to make a combine of these various companies with the Standard? A. No, never; no, sir.

Q. (By Mr. Farquhar.) The commission has been furnished the original form of the incorporation of the Pure Oil Company, and it will be printed as a part of the minutes of this commission. Now, can you furnish with your testimony a copy of the amended one in proper form? A. Oh, yes; I shall be very glad to.

EFFORTS NOW MAKING TO COMBINE THE INDEPENDENT COMPANIES.

Q. That is what I wanted to know. A. Now, as to the changing of that trust; we have not got the voting trust yet. We, perhaps, are crossing the bridge before we get to it; but this has not been accomplished. It has not been accomplished, so far as the combination of the stock of those companies is concerned. All that is in the shape of a trust, out of about three or four million dollars, is $377,000. The other is in contemplation, because we fear that when this present trust of ours—the United States Pipe Line—expires, we shall be in danger, and we are going to put ourselves under cover; that is all.

Q. You have incorporated in the State of New Jersey the Pure Oil Company? A. Yes.

Q. You have how much capital paid in? A. $377,000.

Q. You are still under the operations of a majority of the stockholders bringing in other companies? A. Oh, no; we are simply talking about it and hope to accomplish it. It is not a question that has absolutely been decided, though I expect that it will be done. The amendments have not even been printed; but we are going to try to get this stock in for self-protection, and put it into the voting trust. It has not been accomplished yet by any means.

THE INDEPENDENTS ASKED THE STANDARD FOR PERMISSION TO LAY THEIR PIPES UNDER THE RAILROADS—THEY DID NOT PROPOSE TO SELL OUT TO THE STANDARD.

Q. (By Mr. Phillips.) Now, will you answer the other question in regard to any effort amongst all these companies to make a combine with the Standard Oil Trust? A. I was president and general manager of the United States Pipe Line Company from its inception up to a little over a year ago, and probably I should have been still in the management of it if had my health not failed. I was always present at general meetings and had, under our by-laws, the appointment of all committees. During our trouble that I have recited relative to the construction of this line, I appointed a committee, as chairman of the board of directors, to go to New York and see if some arrangement could not be made with the Standard Oil Company by which they would permit us to go under the railroads of the country. We did not go to the railroads. The railroads had nothing to say about it. We went to the Standard Oil Company, but not for the purpose of selling one single share or one dollar's worth of our property. The resolution or motion offered was that the committee go to New York for the purpose of seeing if the Standard Oil Company would not let up and let us go through to the coast. I appointed that committee under that resolution. Mr. Phillips, Mr. Lee, Mr. Murphy, Mr. King, Mr. Jennings, of Pittsburg, and some other gentlemen were appointed to go there for the purpose I have named. They had no authority to make any proposition to sell the property or to make any settlement with the Standard Oil Company on any such basis as selling out any part of the company's property. I am sure they did not make any such proposition.

EFFORTS TO GET A GENERAL PIPE LINE LAW IN PENNSYLVANIA—METHODS OF THE OPPOSITION.

Q. In regard to the opposition to laying the pipe line through Pennsylvania it was said by Senator Lee that certain dodgers were circulated in the

eastern part of the State. Can you state the purports of these dodgers, or have you any knowledge of them? A. In 1868 the legislature of Pennsylvania passed an act for the incorporation of pipe line companies, as I told you yesterday. We got such a law, through the permission of Mr. Thomas A. Scott, for eight counties in the northern part of Pennsylvania, and the Wallace act of 1874 repealed that law. Immediately upon the repeal we attempted to get a law passed giving the right of eminent domain for the construction of pipe lines. That was introduced regularly from 1874 up to 1883—every session during my career in the legislature, both House and Senate, for ten years. It was my duty to introduce this bill and endeavor to pass it. In 1883 the bill was pending, and the Standard Oil Company, by its agents, had gone all over the southern portion of the state of Pennsylvania, which is a very beautiful part of the country, as you know, and had said to the farmers that if the pipe lines were laid in that region there would be a general destruction of their property; that their orchards would be destroyed, and there would be general havoc, and the pipe lines would explode and probably destroy life as well as property. At the same time they had thousands and thousands of miles of pipe line in the State of Pennsylvania, Ohio and West Virginia. In order to meet and counteract the impression among the people Senator Lee and myself, night after night and week after week, visited the school houses and court houses, and every place where we could get a gathering of people to listen to our explanation of the necessity of the passage of this law. Dodgers were issued and pushed under my arm. The effort was to get my attention to them. As I entered the court house in Lancaster, Pa., there was pushed under my arm a paper which read: "Look out for false prophets." Beneath it read: "These people are endeavoring to pass a law that will destroy the springs on your farms; it will blow up your houses; it will create havoc in your fields, when the pipe bursts, by killing the grass. The most dangerous of all laws."

We had placed our circulars in all the seats of the court house in Lancaster, Pa., and some miscreant went in there and took all of our circulars setting forth our object and what we were after, and in their place dropped into the seats these yellow papers, on which was written, "Look out for false prophets." Those dodgers were furnished—I don't care what the other witness said. He was not on the ground to make any speeches in behalf of the oil country. He can not say those dodgers were not circulated, and if he does he certainly says that which he does not know anything about. I was there through the whole of it, and we went on with that operation week in and week out and month in and month out. We were from 1874 to 1883 getting that law.

$10,000,000 IN REBATES FROM OCTOBER 17, 1877, TO MARCH 31, 1879—THE EVIDENCE.

Q. There was one other question on which your testimony was brought into dispute; that of the $10,000,000 in rebates that was said to have been paid to the Standard Oil Company in a given time. This, I believe, was denominated a lie or a lusty lie. I think it was in connection with this question. A. Well, gentlemen, I do not mean to lie; I do not mean to tell any thing but the truth as I understand it, and I have said nothing before this commission that I can not prove, and my statements made in 1888 are just as sacred to me today as they were when I made them. If I have told any lie I shall beg the pardon of the great United States of America and all my friends therein, and endeavor to rectify any wrong that I may have done.

My authority for that, which I will produce, is unquestioned, and I defy anybody to prove that my assertions or statements at that time were false. I desire you to turn to page 101 of my pamphlet, which I have given you. I need not take your time by reading over all the evidence. It is before you on pages 101, 102, and 103; you can read it as well as I can, but we will go over to 104; there is a recapitulation of the oil business. (See Fiftieth Congress, first session, House Reports, vol. 9, pp. 242, 243.)

I hold in my hand a book of testimony in the case of The Commonwealth against the Pennsylvania Railroad Company. This testimony can be had, I think, in the Library of Congress. It can be found in the library at Harrisburg, and undoubtedly at many other places.

I had the honor to be one of a committee of three to visit Gov. John F. Hartranft and lay before him our grievances; and we invoked the aid of the Commonwealth of Pennsylvania. That good, great, and kind man gave it to us. He required the Pennsylvania Railroad Company to answer the charges made against them with regard to the South Improvement Company contract and other acts, from the commencement of the history of the Standard Oil Company or the South Improvement Company, from 1872 to the final hearing of the suits in 1879. This is the testimony of Mr. Cassatt, first vice president of the Pennsylvania Railroad, making a clean breast of everything pertaining to the contracts. From his admissions and from the admissions of other officers connected with the road I have computed the shipments of oil during 1878 and the first quarter of 1879, making a grand total of 18,556,277 barrels of oil shipped; and from this testimony I have deducted the fact that 55 cents per barrel was paid upon the transportation of that petroleum. I charge the rebates on all that oil to the Standard Oil Company; not only on what was shipped to the coast. As I showed you yesterday, on all oil that went west also they had to have their rebate. Again, it was carrying out the provisions of the old agreement, the South Improvement contract, although that had been repealed. The drawbacks on that oil are even greater than I have said in this report or in my evidence in 1888.

Q. (By Mr. Kennedy.) How much space did Mr. Cassatt's testimony occupy in that book? A. Some 50 or 60 pages. It begins on page 600 and runs to page 737. Here is my authority, and I have given

the pages in my testimony. Let anybody prove that I am mistaken. But $10,000,000 is nothing compared to the rebates paid; it is a bagatelle.

STATEMENTS OF PREVIOUS WITNESSES AS TO THIS ESTIMATE OF THE REBATES.

Q. (By Mr. A. L. Harris.) I think it was stated that the testimony of Mr. Cassatt has been perverted, and the conclusions drawn are not warranted by the testimony. That is the reason, I suppose, that you are asked to refer to the part of the testimony in which this admission is made. A. I have given each page in my testimony of 1888.

Q. (By Mr. Kennedy.) I thought there might be a paragraph or a page in which he made the admission. A. The testimony is not by him only, but by other officers of the Pennsylvania Railroad; that was the object, to find out what the discrimination was.

Q. I think the testimony was to the effect that this $4,771,000 which the Pennsylvania Railroad got was all that you could figure from his statement, and all the rest assumption. A. Oh, no; because, not only did the Pennsylvania Railroad Company get it, if he admits they got $4,000,000, in this twelve or fourteen millions they must have participated.

Q. He says that is an assumption. A. It has been proved; proved by the Hepburn committee, just as plainly as this is proved. If he admits $4,000,000 was paid to the Pennsylvania Railroad alone, it is more than I gave them. My computation is based on the total shipments of oil. I did not say that the Pennsylvania alone got it. I say the rebate is so much; even more.

Q. I do not think he makes the admission in regard to the amount; but his statement is that Mr. Cassatt's admission was in regad to the Pennsylvania Railroad's transportation, and not with reference to the others. A. I have shown the collection of these rebates by contracts. I could produce the three contracts. These railroads were under contract to transport certain classes of oil at certain rates. This all happened from 1872 to 1877, or 1879. I have shown you the 22 cents from the pipe line to the car, and the 49 cents was to go for the transportation of oil from Cleveland and common points in the oil country to New York.

AVERAGE COST OF OIL WELLS.

Q. (By Mr. Phillips.) It was stated here that the cost of drilling a well in 1890, or during the last ten years, was about $2,000. You are a large operator in all the fields, and we should like to have your estimate of the cost of drilling wells during that time. A. Of course, I have drilled a great many wells, running into several thousand, and we always keep track of the expense in our office and the cost of each and every well. We have drilled wells in the lower country, which we call deep territory, that have cost us $8,000, $10,000, some as high as $30,000 each to drill. When you come up to $30,000, that, of course, is accounted for by the fact that you sometimes stick your tools or drop something into the hole, or the well may cave in. Then you are obliged to move your derricks. We have always figured that our lower country wells cost us on an average $8,000. In the upper country we have figured that we could drill our wells for $2,500. We can not do it for that now. That was when you could get pipe for less than half its present price The reason why wells are so expensive in the lower country is that you have to put in three lengths of casing. Some of that casing runs down into the earth 1,600 feet, 2,000 feet. I have loaded into a single hole 150 tons of iron. I should say this—without going into a close calculation of it, the question being sprung upon me here at this moment—that the average cost of a well in the oil country under the present condition of things is nearly $4,000, in my judgment.

Q. (By Mr. Farquhar.) On account of the high cost of iron at the present time? A. I think it was $4,000 before the prices advanced so largely. We can not do it for that now. You can not drill wells at a profit now, at the present price of oil. Iron has gone up 100 per cent and more.

Q. (By Mr. Phillips.) What is your estimate of the average production per well, taking the wells as a whole, during the period named, from 1890? A. That I have not in my mind. If you want me to compute that I will look it up, but can not answer it offhand. That is a mathematical problem.

THE INDEPENDENT PIPE LINE MUST GIVE UP GOING TO NEW YORK AND GO TO PHILADELPHIA INSTEAD.

Q. (By Mr. Clarke.) What is the present status of the United States Pipe Line in New Jersey? Are you running oil there and carrying it part way by railroad to the seashore? A. Yes.

Q. Is that question of the right of way under the railroad in litigation? A. No; it has been settled by the courts.

Q. Settled in your favor? A. No. We have to take our pipes out. We have got to quit and come to Philadelphia. The right of eminent domain in Pennsylvania gives us the right to come to Philadelphia. We have to throw away our expense of upward of $150,000 and turn around and come to Philadelphia with our line.

Q You have to make Philadelphia your seaport? A. Yes.

A PIPE LINE SHOULD BE AUTHORIZED, LIKE A RAILROAD, TO GO ANYWHERE BY PAYING THE DAMAGES.

Q. You say you can not cross certain railroads in the State and can not get to the seaboard there with your pipe lines; what remedy would you suggest for that state of affairs? A. Well, I would suggest that New Jersey pass a law to let us go. But I want to say to you that I went to New Jersey—but in order to answer that question, in order to have you understand, I should have to refer to some persons I should not like to. They are very high in office; one is in the second highest office in the

United States and the next is in the third highest office in the United States.

Q. You think the passage of a free pipe line bill by the legislature of New Jersey would give you the right you long have sought? A. Oh, yes, certainly; because it is only a question of getting through by paying the damages, just as a railroad does. That is what we could not get. I have argued the case long and loud; and my experience there in the State of New Jersey, with the legislature, was one that the public ought to know, but it is so disgraceful that I am ashamed to tell it. By the way, I did not answer a question that somebody asked me: I started to refer to this and you got me off the track.

COMMONWEALTH OF PENNSYLVANIA VS. JOHN D. ROCKEFELLER, ET AL.—THE CAMPBELL CONTRACT.

Q. (By Mr. Kennedy.) I asked you about the testimony of Mr. Cassatt. A. Exactly; and in relation to that compact, the Campbell contract. The contract is here in my hands now. But I want to say to this commission that the outcome of the suit brought by Pennsylvania against the Pennsylvania Railroad was this—the indictment No. 26, session of 1879, Commonwealth of Pennsylvania vs. John D. Rockefeller et al., court of quarter sessions.

(Here the witness read the indictment.)

This was a suit brought by the Producers' Protective Association, or rather a complaint made by them to the Commonwealth of Pennsylvania, which brought suit, and out of this grew the indictment. The case was never tried. They attempted to get a change of venue, and they failed in that. A very stubborn fight was made. They claimed that the oil country was prejudiced, and they could not get justice. They appealed to the supreme court of Pennsylvania for relief, and through some process of law they got it. You lawyers know better than I how they may have obtained it; but the case was dragged along in the same old style that I have told you about, and finally, on account of discouragement and lack of funds, and disagreement of the committee upon the matter, Mr. B. B. Campbell, president of the Producers' Protective Association, settled the case, receiving $40,000, which was used in defraying the expenses that had been incurred, and receiving the contract that has been referred to. Probably it is not necessary for me to read that contract.

Q. (By Mr. Phillips.) You had better give us the substance of it. A. You will find, on page 407 of the Bacon committee's report, the exact language of the contract itself. First of all, the provisions in respect to the Campbell admission, and the United Pipe Line, and then the Pennsylvania Railroad Company's admissions. I would state briefly that this contract was presented to the producers to accept, but almost by unanimous vote they rejected the settlement, and there was a sort of a general breakup over the action of the president of the Producers' Union.

Q. (By Mr. Farquhar.) That does not agree with the record. A. The record is right.

Q. (Reading.) "Resolved, That the general council of Petroleum Producers' Union approved the action of the president in withdrawing the suits against the Standard Oil Company as wise and judicious." A. I am very glad you corrected me on that. The reason why I said they did not accept it was this: There were only two men who signed the contract, B. B. Campbell and A. N. Perrine. I refused, as did everybody else. B. B. Campbell, being a manufacturer of oil, received the rebates, but there was some question about it. For a long while there was some difficulty between the Pennsylvania and the northern railroads because Mr. Campbell was permitted to go in and ship his oil.

NATURE AND EFFECTS OF THE DIVISION OF TRAFFIC PROVIDED FOR IN THE CONTRACT OF 1884.

You are anxious to get something new, up to date. Now, here is a contract that went into effect in 1884, and was recently brought out in a suit for discrimination for a large sum of money, which is now pending against the Pennsylvania Railroad. The amount sued for is several hundred thousand dollars. Representatives of a large concern in this country purchased oil and shipped it over the Pennsylvania Railroad, and sued for rebates, and they have recently produced the contract of 1884. I understand it is in existence at the present time. If I am mistaken about its being in force, I desire to be corrected, but I understand it is in force at the present time. If you desire to have it read I will get somebody to read it, but it is what I term a nefarious contract.

Q. (By Mr. Clarke.) Can you answer the question whether that contract provided for rebates? A. It provides for something that is a great deal worse.

Q. (By Mr. Phillips.) What is that which is worse? A. It requires that 26 per cent of the shipments of oil over the roads. The pipe lines can carry it all if they want to, with the exception of the residuum. The railroads need not have made this contract, because the residuum has to go in cars anyway. You can not pump it.

Q. (By Mr. Clarke.) Do you call that nefarious? Do you see anything written in the contract that a certain per cent. of the product shall go over the road? A. Yes.

Q. I would like to have you explain wherein that is wrong? A. I would like to have it read.

Mr. Phillips. If there is no objection the contract will be read.

A. I confess to you the provisions of this contract have only been communicated through another source, and it has never been given to the public, to my knowledge, until it came out in this suit. It is practically new to me, and I think will be new to the world.

"Agreements Between the Pennsylvania Railroad Company and the National Transit Company, Dated August 22nd, 1884, Being Two Agreements of Even Date, as follows:

"Memorandum of a traffic agreement, made this 22nd day of August, 1884, between the Pennsylvania Railroad Company, hereinafter designated the Railroad Company, and the National Transit Company, hereinafter designated the Transit Company, witnesseth:

"That for considerations mutually interchanged, the parties hereto agree, each with the other, as follows:

"First. The Transit Company owns an extended system of local pipes in the oil regions of Pennsylvania and New York, which are grouped into a separate division, known as the United Pipe Lines Division of the Transit Company's Local Division.

"The business of this division is to collect oil from producer, store it in tanks, and deliver it, as may be desired, to any through carrier of petroleum, which will transport the same to where it is to be refined or otherwise disposed of.

"The Transit Company also own through or trunk line pipes extending from several points of connection with the aforesaid local pipe division to various refining and terminal points.

"With these latter pipes, which will be hereafter entitled the Transit Company's Trunk Line Division, it competes in the through carriage of petroleum with all other through carriers, whether pipe or rail.

"The business of its local division is therefore entirely distinct from the business of its through trunk line division.

"It undertakes and agrees that its local division will deliver into cars furnished by the railroad company at any of its regular delivery points and under its regular delivery rules whatever petroleum the owners thereof may desire to have so delivered and as the railroad company may furnish cars to transport, and will make no discrimination either in its local charges for carriage, storage and other services, or in the use of any of its local facilities, against such oil, but will at all times treat it in the said respects as favorably as it at the same time treats any other petroleum which may be delivered to its own trunk line division or to any other through carriers.

"Second. The transit company agrees that all petroleum brought to the Atlantic seaboard by all existing carriers, whether rail or pipe, now engaged in transporting such property, or which may hereafter engage in such transportation in conjunction with the transit company's pipe lines, shall be ascertained monthly, and so much of it as shall have been shipped in the refined state shall be reduced to its equivalent in crude oil by considering that one and three-tenths (1 3-10) gallons of crude are required to make one (1) gallon of refined oil. It further undertakes and agrees that if of the total so transported the railroad company shall not have moved in its cars twenty-six (26) per centum thereof, the transit company shall cause to be delivered to cars furnished by the railroad company at Milton, Pennsylvania, such quantity of crude petroleum as shall, when added to the amount which has been actually transported by the railroad company to the seaboard in said month, make the total transported by the railroad company in said month equal to said twenty-six (26) per centum.

"The railroad company agrees to furnish the needful cars and facilities, and promptly transport the oil which the transit company agrees in this contract to deliver to it at Milton; Provided, That if during any month the railroad company is not able to assign from its oil equipment a sufficient number of cars to the traffic of the transit company to move the proportion of oil herein provided to be delivered at Milton, then during that month the transit company shall be required to so deliver to the railroad company such quantity of oil as the railroad company shall be able to transport, and shall not be required to make up any deficiency that may occur during said month.

"Efforts shall be made by the transit company to deliver so much during each month as will probably be necessary to make the total carried by the railroad company equal to said percentage.

"Shortages, if not due to short supply of cars, and such excesses as may be found to have occurred in any month, shall be adjusted in the following month or as soon afterwards as shall be possible.

"Third. It is agreed that the proportion of petroleum which the transit company is to deliver under the second section of this agreement shall be considered as petroleum transported from Coalgrove, Pennsylvania, via Milton, Pennsylvania, to the Atlantic seaboard, and that the railroad company shall be entitled to one-half of the current through rates thereon.

"It is agreed that whenever the through rates shall be so low that the railroad company shall suspend the movement of oil by its cars at other points than Milton the transit company shall during such suspension not be bound to deliver to the railroad company any oil at Milton.

"Fourth. All joint rates for the joint transportation of oil from any delivery point of the local pipe division aforesaid to any refining or terminal point shall be fixed by the railroad company, subject to the advice and concurrence of the transit company.

"It is agreed that said joint through rates shall be uniform to all parties. The railroad company stipulates that it will make no discrimniation whatever, either in rates or facilities, against the transit company or against the oil which the said transit company herein covenants to deliver to it.

"It is agreed that the joint through rates to Philadelphia shall always be five cents less per barrel on crude oil, or its refined equivalent, than shall be currently charged to New York harbor.

"It is agreed that the joint through rates, which shall be so fixed from time to time, shall be as low as shall be currently made between same and similar points by rival carriers of petroleum, and shall not be higher than an approximate mileage proportion of rates current on petroleum produced south of Oil City, nor than rates from Olean and similar points.

"It is also agreed that rates on refined oil and other products of crude oil shall be fixed by the railroad company upon the following basis, viz.:

"From railroad stations in the oil region to which oil is delivered by local pipes the rate to any point east thereof on a barrel of refined oil or other products shall be one and three tenths (1 3-10) times the current rate on a barrel of crude oil to the same point.

"From Pittsburg the rate to any point east thereof on a barrel of refined oil or other products shall be one and three tenths (1 3-10) the rate currently charged on crude oil to any such eastern point from rail points of Oil City: Provided, That one and three-tenths times the charges for moving a barrel of crude oil by rail or through pipe from the local pipe to Pittsburg shall first be deducted therefrom.

"From Cleveland and Buffalo the net rate on a barrel of refined oil or other products to any point east thereof shall be not less than is currently charged to the same point from Pittsburg.

"Fifth. Whenever the term barrel is used herein, unless otherwise specified, it means 45 gallons of crude petroleum, and whenever the term oil is used herein, unless otherwise specified, it means crude petroleum.

"Sixth. The transit company hereby agrees that it will not make any more favorable terms with any other rail line connecting with any of its pipes than the terms which under this agreement are given to the railroad company, or if for any reason it should desire to do so, it hereby agrees to modify this contract so as to give the said 'more favorable terms' to the railroad company.

"Seventh. All existing contracts between the parties hereto shall be deemed to have been accomplished and shall become void and of no effect upon the day this contract goes into operation.

"Eighth. This contract shall take effect as of the first day of August, 1884, and shall continue until terminated under the provisions hereof. It may be terminated after August 1, 1889, by either party hereto giving 90 days' written notice to the other of a desire that it shall end, at the expiration of which notice it shall cease and determine.

"In witness whereof the parties hereto have executed this agreement under their corporate seals the day and date above written.

"THE PENNSYLVANIA RAILROAD COMPANY,
[L. S.] By FRANK THOMSON,
"Second Vice President.

"Attest: JOHN C. SIMS, JR., *Secretary.*

"THE NATIONAL TRANSIT COMPANY,
[L. S.] By C. A. GRISCOM, *President.*

"Attest: JOHN BUSHNELL, *Secretary.*"

"Memorandum of agreement made this 22nd day of August, 1884, between the Pennsylvania Railroad Company, hereinafter designated the railroad company, and the National Transit Company, hereinafter designated the transit company.

"Witnesseth: That for considerations mutually interchanged the parties hereto hereby agree with each other as follows:

"Whereas, the parties hereto have made an agreement of even date herewith, in which, among other things, it is stipulated that under certain circumstances the transit company shall deliver certain crude petroleum into cars furnished by the railroad company at Milton, Pa.; and

"Whereas, it has been proposed that the railroad company shall contract with the transit company to the effect that the transit company shall transport through its pipe lines the aforesaid crude oil, which, under the other contract aforesaid, it has undertaken to deliver into the cars of the railroad company at Milton.

"Now, therefore, this agreement witnesseth:

"First. The railroad company agrees that instead of delivering said crude oil to said cars at Milton the transit company shall transport the same through its pipes to destination, and the transit company undertakes and agrees to do such transportation. It is mutually agreed that the compensation to the transit company for doing said work shall be as follows, viz:

"Whenever the through rate for transporting a barrel of crude petroleum from Olean to Philadelphia shall be 40 cents, the transit company shall receive eight cents per barrel as such compensation for so much of said oil as under the provisions hereof shall be considered as Philadelphia oil.

"For each five cents of increase or diminution in said rates form Olean to Philadelphia the said compensation on Philadelphia oil shall be increased or diminished one cent per barrel.

"Provided, however, That the transit company shall not be obliged to accept less than six cents per barrel, and shall not receive more than 10 cents per barrel on such Philadelphia oil.

"It is agreed that the said compensation on the oil which under the provisions hereof is to be deemed New York oil, shall be one cent per barrel greater than it currently shall be on Philadelphia oil.

"Whenever, and from time to time, as the said joint through rates shall be so low that the said minimum compensation to the transit company of six cents per barrel shall be as much or more than the railroad company's share of said joint through rates, this contract may, at the option of either party hereto, be suspended during all or any part of the time such low rates shall prevail. During such suspension the aforesaid other contract shall alone remain in force; but whenever, and from time to time, as said joint through rates shall again be high enough to make the said minimum compensation, under said sliding scale, less than the said share of said joint through rates, this contract shall again resume its force and effect.

"Second. The transit company agrees to account for and pay to the railroad company on or before the 20th of each month the latter's share of the joint rates on joint business via Milton (as provided in said other contract) during the next preceding month, first retaining, however, the proportion of such share which it is hereinbefore agreed the transit company is to have for its services in pumping said oil to the seaboard.

"It is agreed that all such joint business shall be considered as having been transported from Coalgrove via Milton, Pa., to the Atlantic seaboard, and that it

shall be considered as having gone either to Baltimore, Philadelphia or New York, or partly to each. The proportion thereof which has constructively gone to New York shall be determined upon the following basis:

"The total amount of oil transported in any month by the railroad company to New York shall be compared with 50 per centum of the total oil which the railroad company is entitled to carry in said month under the aforesaid other agreement. If the amount which has been in such month carried by cars to New York shall be less than 50 per centum then the difference shall be considered as having been moved by the pipe to New York at New York rates, and shall be accounted for accordingly. The remainder of the oil via Milton shall be accounted for at Philadelphia rates.

"This contract shall commence and terminate simultaneously with said other contract.

"Witness the corporate seals of said parties duly attested the day and date above written.

"THE PENNSYLVANIA RAILROAD COMPANY,
[L. S.] By FRANK THOMSON, *President.*
"Attest: JOHN C. SIMS, *Secretary.*
"THE NATIONAL TRANSIT COMPANY,
[L. S.] By C. A. GRISCOM, *President.*
"Attest: JOHN BUSHNELL, *Secretary.*"

The Witness. Mr. Chairman and gentlemen, according to this contract, first, the rates must be maintained as established by the pipe lines; that is, the open rate of 45 cents. The contract was made for the purpose of sustaining rates. The outside refineries were compelled before the construction of the United States pipe line to ship all their oil by rail to the sea for export. The reason for making this contract and guaranteeing about 26 per cent of the tonnage to the coast was to insure the maintainance of the rate according to its provisions. If 26 per cent of the oil was not shipped over the roads, the Standard Oil Company was obliged to make up that in dollars and cents for the payment of the freight at the toll rates. Now, the point is this: The cost of collecting oil from the well to the railroad or the storage tanks by what we term the gathering lines is from three to five cents a barrel; say five cents. I speak intelligently on that point because I am a collector of oil by several hundred miles of line belonging to myself. The cost of carrying the oil through to New York, or rather to a point in New Jersey 50 miles from New York, is about the same. We gather oil from the well and deliver it in New York at a cost not exceeding 10 cents a barrel at the present time. Now, if this contract was out of the way the railroads would seek that rate, just as they come and seek your freight at the present time, or seek to carry a person or a number of persons to Chicago. But this contract compels them to keep the rate up and compels an outside refiner to pay this enormous rate of freight. The Standard Oil Company delivers all their oil to New York at a cost of not over 10 cents a barrel. By railroad a barrel of oil has to pay 45 cents; and the Standard gets this rate held by guaranteeing 26 per cent of the tonnage to the several railroads which are classed as oil roads.

THE CONTRACT DID NOT REALLY INCREASE THE BUSINESS OF THE RAILROADS.

Now, then, the by-products of petroleum are just about what this 26 per cent would amount to. Among by-products there are benzine and gasoline and tar. There is about 26 per cent they can not pump through the pipe, because it consists of lubricating oil and tar and such things as benzine, etc. The intent of this is to maintain rates, that there may be no competition between the railroads and the National Transit Company as a carrier. That is what I object to, and that is what the contract says. It is a combination which is illegal.

Q. (By Mr. Phillips.) Do we understand this, senator, from your testimony, that there is about this amount in by-products, and therefore they do not ship any crude or refined oil by rail in consequence of this contract? A. No; the railroad would have to have this carrying anyhow. They would have to carry benzine; you can not pump it. You can not pump wax. There is 26 per cent. of oil that you can not get through the pipe line if you want to.

THE RAILROADS HAVE RAISED THE RATE.

Q. (By Mr. Clarke.) As I understand you, you are not finding fault with the percentage or apportionment of this freight, but you are finding fault that the price is too high, and that it is an agreement to maintain rates? A. No; I am finding fault because they cut off this competition; cut it from me in my products. The railroads have carried this stuff at eight cents a barrel. I paid for years 33 cents a barrel to carry this stock through. At the present time the rate on these products is 16½ cents a hundred, making 52 1-10 cents a barrel in bulk. The railroads have raised the rates. Then, in barrels, you have to pay for the weight of the barrels; that raises the total to something like 66 cents. That is the rate of freight.

Q. Then you do not criticise this partly because the rate is too high? A. I do on that ground. It has been raised from the original 45-cent agreement.

REASON FOR BELIEVING THE CONTRACT OF 1884 TO BE STILL IN FORCE.

Q. (By Mr. Kennedy.) That contract was entered into three years before the passage of the interstate commerce law. Have you any evidence that it is still in force? A. I only know it from the admission of a railroad man who said that it was. He came to my place and invited me to go to a certain point and establish a loading station to ship oil by water to New York. Well, it is the Buffalo, Rochester and Pittsburg railroad. I went to Rochester and I met the gentleman. I picked out the location for our station and made arrangements with him for the transportation of my oil to the Erie canal. The station was to

be built on their own land, with a nominal rental, which was agreed upon, and the transportation from Bradford was to go that way. He then said: "I would like to have you build a pipe line down at a place called Irvings and bring oil down to the Rochester and Pittsburg railroad and let me draw it to your factory," all of which I agreed to do. He said: "They do not see fit to recognize us as an oil road and I am going to do some of this business." All at once he was recognized as an oil road and he was to get his percentage under this contract. My station was not built, and my pipe line was not built to bring oil to his road. That was two years ago; this contract was in existence at that time. Under these circumstances I believe it to be in existence today.

Q. Was that contract made for a term of years? Was any limit named in it? A. I do not think there was; let us see. I think it is perpetual.

AS TO THE RECORD OF TESTIMONY TAKEN BY A COMMITTEE OF CONGRESS IN 1872.

Q. (By Mr. Farquhar.) In a part of your testimony early this session you read the testimony of Peter H. Watson with respect to the South Improvement Company contract? A. Yes.

Q. You read from a pamphlet here. It, of course, is not official authority for the commission? A. That was evidence; it is on file.

Q. But we want to know where this evidence came from and who took it. A. It is in the reports of the congressional investigation of 1870 and 1871.

Q. This testimony you have read—I want to correct the date of this. This may be important. Your own reporters may have come here to take your testimony here in Washington. They had an interview with the congressional committee on the 25th—with a committee which was a sub-committee. A. What year was that?

Q. 1872, at which time a subcommittee was appointed to take testimony and subpoenas were issued for Watson and Lockhart. Now of course if this is simply a printed pamphlet the question is—. A. You have your official record here. You have got it in the library—the investigation of congress. It is here on file, the same as the investigation of 1888.

Q. This was in 1875—1872-1875? A. It is the same as the investigation of 1888. It should be on file, because it is an investigation by congress.

Q. (By Mr. Phillips.) Is it in the Hepburn report? A. No, no; it is 1871. The Hepburn report was in 1879. No; it is one of the first investigations ever instituted.

Q. (By Mr. Kennedy.) You stated yesterday that you did not know what committee took the testimony.

Q. (By Mr. Farquhar.) Your testimony ought to show the commission the official source that it is taken from. A. If you will give me access to your library here I will find it.

Q. (By Mr. Phillips.) I wish to ask Mr. Boyle for information simply on this line.

Q. (By Mr. Farquhar.) This as presented here is unofficial. A. I refer you to the library.

Q. (By Mr. Phillips.) Mr. Boyle will tell you of it.

Mr. Boyle. I have been searching for that report all through the books. I have not been able to locate it. There were newspapers giving reports at the time of the subcommitee. It was a subcommittee of congress of the house, of the spring of 1872, beginning on the last day of March, 1872, and continuing at various dates for two or three years.

Q. (By Mr. Farquhar.) The chairman of the committee seems to be well known—C. W. Gilfillin. A. I think he was in congress at that time.

Q. That is the identification you make? A. I make that identification, that it is a congressional report and was published at that time. At that time I read the testimony and it is familiar to me now. I was going to get it, but I could not. I know it was an investigation of congress and I suppose it is on file, just as these books are on file; it should be.

Q. (By Mr. Phillips.) You do not know of your own knowledge that it is true, but if it is found by this commission on file you want it to be considered a part of your evidence? A. I was in Washington in 1872 myself and I know the investigation took place, and I know I have a complete copy of it—a paper file of it at home. I was keeping my scrapbook, and I think I can produce the investigation. I think I can produce the book itself. I think I can, and I shall be very glad to do it.

Q. (By Mr. Farquhar.) I should like to make a statement from Mr. Gilfillin's own report, whom we know to be of good repute everywhere. It seems that your own people took this matter to the committee of congress and you had your own reporters. The question is, was it ever reported officially by congress? A. Well, does the congressional committee go into a room without a stenographer?

Q. Sometimes; quite frequently. A. It is the strangest thing I have heard.

Q. I am not discussing where the testimony came from. I think the origin of the testimony—it would be well for one of the parties to see that it is verified. A. I rely upon that testimony as being valid, and the investigation can be produced. It is dated from Washington and I know the investigation took place, and I know Mr. Gilfillin was on the commission. I do not know whether he was here on that day or not.

SCARCITY OF COPIES OF THE TESTIMONY OF 1888.

Q. (By Mr. Phillips.) You said that, on your information and belief, as prescribed by the oath, you believe it to be true? A. Just exactly as I believe my own testimony to be true. It is very unfortunate that it is not here; and I want to say to you right here that of this testimony of 1888 there were several thousand volumes printed, but I understand there are only 300 of them in circulation today. I could not get one myself until just by good fortune I got one the other day from a friend who had two. Nobody knows how that evidence was spirited away from here, but it is gone.

Q. (By Mr. Farquhar.) 1888? A. Yes. There were only 300 volumes sent out. I sent to Congressman Stone of our district for one.

WHY THE WITNESS, HAVING GOT BOOKS INTO COURT WHICH HE BELIEVES CONTAIN PROOF OF CRIMES, LET THEM GO UNEXAMINED.

Q. (By Mr. Ratchford.) I understand from your testimony you make the broad statement that if the books of the railroad companies could be brought into court some of the officials would be sent to prison? A. If you can send anybody to prison for violating the interstate commerce act, I say yes. I am not positive whether there is a criminal clause in it or not.

Q. If you wish to modify that statement you can. A. If there is not a criminal clause I do want to correct it; if there is, I will let it stand. I stick to my statement if that is the law.

Q. Do I also understand from the previous part of your testimony that you caused one or more of those companies to produce their books in court? A. The Pennsylvania railroad.

Q. In the courts of Clarion county? A. McKean county.

Q. You state that you produced convicting evidence against them? A. We did not examine the books at all.

Q. Why? A. Because the case was settled.

Q. Why did you settle it? A. I told you yesterday that my partners got tired of fighting it. We had been at it for three or four years and they offered us $35,000 and we settled it. The claim was for $107,000.

Q. Settled it for $35,000? A. And costs.

Q. If the discriminating practices by railroads and the rebates that were given by railroads are so injurious to the interests you represent, and to all other interests, why did you settle it for $35,000, or how did you believe yourself justified in settling for any sum? A. Our association was too poor to carry it on. They could have gone on, and could have extended that suit for 10 years.

Q. And yet you are satisfied, and have been satisfied, that convicting evidence would have been adduced in court had the books been investigated? A. We got all the evidence we wanted for them to settle upon and we tried to get the books into court in the early history of the trial; but we could not get an order before the master, in taking this testimony, because he had not the power. When we got them before the McKean county court, the circuit judge having the power, we demanded the books and papers. He issued an order and the books came. If my disposition had been followed, even in the depressed circumstances that I was in—if I had had my way about it I would have examined every one of the three tons of books. But I had a partner, Mr. Logan, who had lost every dollar in the world in speculation, and he said: "This money will do me good, and I would like to have you let up."

Q. You assign, then, as a cause for settling the trouble, the fact that the association controlled by you was too poor to fight? A. And the dilatory action of the court.

THE OIL BUSINESS IS MORE PROSPEROUS THAN IT WAS TWO YEARS AGO.

Q. (By Mr. Clarke.) Are you able to state whether the condition of the oil business generally is more or less prosperous now than it was two years ago? A. Oh, it is more prosperous now, from the fact that all the factories of the country are running, and there is an enormous demand for goods, and the production of oil in New York and Pennsylvania is not adequate to the demand. That is one reason for the advance in the profits of petroleum. Every factory and every spindle is running and every coal mine and every iron mill and there is an enormous demand for the goods. We could sell from my factory five times as much as I am making, if I had it, and at good profits.

THE WITNESS HAS RECEIVED NO REBATES SINCE 1872, EXCEPT WHAT HE HAS COLLECTED BY LAW.

Q. (By Mr. Farquhar.) Have you frequently in your own business enjoyed rebates. A. Never. Now let me modify that. In my business previous to 1872, in the refinery at Titusville, Pa., rebates were a common thing; but we were young and new in the commercial business, and the fellows in Cleveland and Pittsburg were a little more experienced. We did not seem to make very much money. They were running full tilt with their wells, barrel shops and everything, and we began to look about to see what was the matter. We went to Pittsburg and we learned, to our astonishment that certain concerns were getting 25 cents a barrel. We were large shippers and we demanded to be granted the same. That was away back in 1870. We were given 25 cents, and then we got on to the fact that some of the refiners were receiving 75 cents back, and some other refiners were receiving 50 cents. The rate at that time was in the neighborhood of $1.50, and oil could be carried at a profit today at 25 cents. From that time to this—no, I am not guilty.

Q. (By Mr. Phillips.) Following that up, have you in recent years received rebates? A. No.

Q. For how many years? A. Since 1872, excepting rebates we collected by law.

Q. Not since 1872? A. I stated here that the president of the Pennsylvania said they were not giving any, but the auditor and bookkeeper admitted it.

MR. LOGAN, OF THE SOUTH IMPROVEMENT COMPANY, WAS NOT THE WITNESS'S PARTNER.

Q. I have been requested to ask Senator Emery a question. Mr. Logan, who was one of the parties to the South Improvement Company, is there, I believe, today? A. Yes.

Q. Now, is that the same Logan that was a partner of yours in Philadelphia in recent years? A. No; Alfred H. Logan is my partner. The two Logans that were connected with the South Improvement Company, William P. and John P. Logan, are both at the present time living; but Alfred is dead—my old partner.

THE REMEDY: GOVERNMENT OWNERSHIP OF ALL MEANS OF TRANSPORTATION, ESPECIALLY OF RAILROADS.

Q. We have been in the habit of asking persons here whether they had any remedial legislation to propose along any lines of the inquiry. Have you anything to propose to the commission in the way of remedial legislation to meet these problems? A. I will simply state very briefly, because I do not expect to go into an argument on that point. I would simply say this: That I am an absolute believer in the government ownership of all means of transportation, and especially of railroads. I was anxious that when the United States government had the opportunity of taking in the Central Pacific railroad it should do it. All the railroads of Germany, excepting two in the south, are owned by the government, and discrimination is not known; nor is there any dissatisfaction in business. They often go so far in that country as to take the canals; but the canals are free. If the waterways and the railroads can be put under government control, gentlemen, you will do away with all difficulties that exist today, because the prime movers of all this trouble are the railroads. They make the trouble by giving discriminating rates, or giving rates to favored shippers lower than they give to the general public.

THE LAWS WE HAVE WOULD SERVE IF THEY WERE ENFORCED BY ACTUAL IMPRISONMENT OF OFFENDERS.

I know of no better remedy, because you have laws upon the statute books of the United States that would alter the present condition of things if they were enforced. If you would make an example of these men, if there was a criminal clause in the interstate commerce act, and put them behind the bars, I think that would strike some terror to their souls. I recollect that, owning a large flouring mill in southern Michigan and quite a large amount of land in wheat in North Dakota, I desired to ship some of this most excellent hard wheat down to Three Rivers, Mich., and manufacture it, and I wanted a transit rate. It was given me previous to the interstate commerce act by the then manager of the road. I went back the next year and he said: "I can not do by you as I did last year, because the criminal clause of the interstate commerce act is such that if I violate it I am liable to get behind the bars, and I am afraid of them. Therefore, I can not make a rate by which you can ship wheat from North Dakota and manufacture it and ship it to the east." Now, I say, Mr. Chairman and gentlemen, that some way has got to be found to cut off the rebate and drawback practices of the railroads. The mass of the people in this country are incensed and that dissatisfaction reaches to the minds of all classes of men.

THE GOVERNMENT COULD MANAGE THE RAILROADS—EUROPEAN EXAMPLE.

I am firmly of the belief that if the government would take charge of the railroads as it took charge of the transportation of the mails it could manage and control the railways and waterways in this country as well as it can control the mails. The example of Germany is before you; the example of Norway and Sweden. If I recollect right, 18 years ago the kingdom of Norway and Sweden did not own a mile of railroad. Poor as those nations are, they saw English capital coming into that country and building railroads north and south up to the great Bessemer mines in the northern part of Sweden, and their own manufacturers were unable to compete, shipping over the same lines of road. Complaint was made to the legislature and they at once said: "We will own these railroads ourselves." And they bought them from the English capitalists. When I was in Norway and Sweden three years ago, while I was there the government took the control of them, and they own today the principal roads north and south and through both those countries. They have not cared to take the lateral lines east and west, but they make a rate from the common points of these lateral lines to the water front, and they prorate with the lateral lines belonging to the smaller companies. They have brought back into the markets the old manufacturers and they are today a happy people, because the government has taken hold and made the rates equal to everybody—to the Englishman, to the Frenchman, to the German, and the Yankee, and everybody else. We distribute oil in those countries, and we find no discrimination. Government ownership is my proposition.

THE CORPORATIONS ELECT LEGISLATORS—STATE OFFICERS AND UNITED STATES OFFICERS IGNORE COMPLAINTS OF VIOLATIONS OF THE LAW.

You have upon the statute books today one of the best laws ever written, known as the Sherman act, passed in 1890; but the difficulty in this country is that you can not enforce the law, or at least you do not. Complaint of our difficulties was made during the Cleveland administration to the attorney general of the United States, and no answer was made by the recipient of the letter. And to the present administration complaint was made more than eight months ago. The letter was pigeon holed. In the state of Pennsylvania we have asked the aid of the commonwealth, by application to the governor, since the suit I have mentioned. The letter was pigeon holed. The power of these monopolies and combinations is such that they elect or nominate their own men to serve in the legislatures. They make their own nominations a year ahead of time to prepare their candidate; and he is schooled to know their wants first and the people's second. I say that if our courts of the state, our attorney general of the state, our attorney general of the United States would put forth the strong arm of the government, under the laws that exist, they could stop these encroachments upon the rights of the people. I say that if they will not do so you must come to the control of these great transportation lines, which are causing all this trouble, by government ownership. I have been a traveler in every part of the world that I could reach by water or rail; and I have found this country advertised from China to the islands of the

east as being a country whose people are bound hand and foot by corporate power. As I told you yesterday, we came to congress, as you saw here, in 1872. We came here again and again. We have come to the attorney general of the United States a half a dozen times without result; and it seems to me that the courts are approached without result also. The settlement of litigation before the courts is delayed. Corporations come when they please and stay away when they please. They defy the courts under the plea that it will incriminate themselves if they give evidence. What are you going to do about it? If the government would stretch out its arm and take this man and say, "Answer this question or go to prison for contempt of court," he would answer. Now, I say government ownership of railroads would be my remedy unless we can get attorneys general of the United States and of the several states that will enforce the laws.

UNFAIR TRADING SHOULD BE PROHIBITED.

Q. Suppose that the government did own the railroads today. Would not these great corporations or trusts still have the power to follow the smaller merchants into the cities and towns and sell oil or any other merchandise very low at given points? And could not these corporations with their great accumulations of wealth still prevent the small corporations from doing business and the merchant from selling his goods in various markets? A. In that case you would want the law I spoke of yesterday—such as I think is adopted by Germany—to prohibit unfair trading. You have got to take care of the interests of the common people of this country. If you do not, you are going to have trouble.

WASHINGTON, D. C., *November* 10, 1899.

TESTIMONY OF MR. ANDREW D. GALL.

Manager of the Gall-Schneider Oil Company, Limited, Montreal, Canada.

The commission met at 2:10 p. m., Mr. Phillips presiding. Mr. Andrew D. Gall was introduced as a witness, and being duly sworn testified as follows:

Q. (By Mr. Jenks.) Will you kindly give your full name and address? A. Andrew D. Gall, Montreal; a British subject.

Q. What is your business? A. We are engaged in the marketing of petroleum products generally, principally in the Province of Quebec, in Canada.

Q. Do you handle American oils at all. A. Almost exclusively.

PRODUCTION OF PETROLEUM IN CANADA.

Q. Can you give us an account of the production of crude oil in Canada, giving us the different places of production and something as to its extent? A. The production of oil in Canada is confined almost exclusively at the present time to western Ontario; that is, the Bothwell, Oil Springs and Petrolia districts, all of which are in western Ontario. The production of oil is largely in the hands of private individuals. The Standard Oil Company, as a company, does not own a great number of wells, but some of the men formerly in the old Imperial do. I will explain that the Imperial Oil Company today in Canada is directly the Standard Oil Company. It was the name of the company in Petrolia before the Standard Oil Company got control of the Canadian market, and has been continued under that style.

Q. You say that the Standard Oil Company has gotten control. Do you mean that the Standard Oil Company bought the stock of that company and continues the company under its old name? A. Yes; under the name of the Imperial.

Q. (By Mr. Smyth.) The Standard Oil Company are stockholders now in that company? A. The Standard Oil Company are stockholders in that company. Mr. Fitzgerald, the former president of the old Imperial, admitted that only a small proportion of the stock was held by Canadians at the present time.

Q. They bought that in open market? A. Well, I do not know. It was a kind of a deal; I do not know whether you would call it open market or not. There were a number of men who were formerly in the old Imperial who have large producing interests in Canada. These men no doubt control between 20 and 25 per cent. of the production. The rest is held by the independents, or small producers, pumping from 50 to 500 barrels per month.

Q. (By Mr. Jenks.) If I understand you, then, the Imperial Company, of which the Standard Oil Company owns the controlling interest, controls about 25 per cent. only of the production? A. Of the production, yes.

Q. About how much is the total production of Canada? Can you give us the figures? A. Yes. The total production of crude oil amounts to about 750,000 to 800,000 barrels per year of 35 imperial gallons each.

CANADIAN OIL WORSE THAN OHIO.

Q. What is the quality of this Canadian oil; is it like Lima oil in Ohio, or white said oil? A. We have handled a good deal of Ohio oil and of course it is not to be compared with the Pennsylvania at all; but comparing the Canadian with what we get from Ohio we find that in marketing it at an equal price we can always get a preference for the Ohio product, so that I should be inclined to think that people would prefer the Ohio to the Canadian product.

Q. (By Mr. Smyth.) You say "we," do you represent the company? A. Yes. I might say that I am president and managing director of the Gall-Schneider Oil Company, limited.

Q. Do you produce petroleum—do you have wells? A. No; we have nothing to do with that whatever—it is only marketing it.

Q. Do you refine the crude? A. We have nothing to do with the refining.

Q. You simply buy refined oil? A. Yes.

Q. (By Mr. Jenks.) You handle also crude oil? A. No, sir; only refined, lubricating, etc.

REFINING IN CANADA ALL DONE BY THE STANDARD NOW.

Q. About how much oil is refined in Canada, and what proportion of that is controlled by the Standard Oil Company? A. Well, these figures I am about to give are supposed to be official. They are made by the department of agriculture. Up to the present time of course all oil had to be inspected and went through the inland revenue or customs department, and I presume the figures are correct. The quantity of illuminating oil that was produced and sold by oil refiners in Canada in 1896 was 11,207,150 imperial gallons, valued at $1,251,122; of benzine and naphtha, 719,453 gallons, valued at $70,733; of gas and fuel oils, 6,788,353 gallons, valued at $261,618; of lubricating oils and tar, 1,447,455 gallons, valued at $77,109. The total gallonage for 1896 was 21,176,682, and the total value $1,792,890. The total gallonage for 1898 was 21,153,192, and the value was $1,723,293.

Q. Can you tell us about what proportion of this refined product is refined by the Standard Oil Company? A. Today every gallon is refined by the Standard Oil Company.

Q. That is, the Standard Oil Company now has control of all refineries in Canada? A. Complete control.

Q. By complete control you mean they own them? A. They own them all. There is one—there is the old Imperial in existence today.

Q. How long is it since the Standard Oil Company secured this complete control of the refined product of Canada? A. That deal was put through in July or August, 1898.

Q. Perhaps you can give us a little fuller statement about it? A. Well, I do not know exactly how it was done, I am sure. It was simply a deal of the Standard Oil Company, and how they did it I don't know. They bought up all the refineries and they have demolished all of them except the old Imperial plant. That is running now and there is a plant at Sarnia, a little farther from Petrolia.

Q. How many independent plants were there before? A. I have them here. Before the trust got control of the business there were five refineries in operation and four refineries that were not in active operation at that time, although not closed up by any means. As I stated before, all of these, with the exception of the old Imperial Company's works at Petrolia, have been dismantled and most of the material broken up and sold as scrap or removed to Sarnia. I know about the figures they paid for one concern. That was the John McDonald refinery. He told me that he got $65,000 for it and that it was not worth $10,000.

Q. You spoke of their having removed part of these refineries to Sarnia? A. They removed part of the material, I believe in building up their own works at Sarnia.

AMOUNT OF CANADIAN REFINED OIL AND AMOUNT IMPORTED.

Q. Do you know whether the amount refined at the present time is less or greater than the amount refined by the five refineries previously? A. I do not see how it can be greater. The production of crude has been about the same, and I do not see how it can be greater than the production.

Q. You think it probable, however, that they are refining all the crude oil now. I judge from what you say that possibly this one refinery at Petrolia is larger than the others have been at Petrolia, and that the one at Sarnia is a little larger. Have these two as much capacity as all the old ones? A. I guess so; yes.

Q. While there has been a concentration of several into one management, the total output has not been lessened? A. I do not think it has been lessened. It may have been somewhat increased, some crude having been sold for other purposes before, they may have made some changes which have increased it somewhat.

Q. (By Mr. Smyth.) I suppose there is as much crude refined as is demanded? A. No, sir.

Q. There is demand for more refined oil than there is on the market? A. Much more.

Q. (By Mr. Jenks.) How much of the oil used in Canada is refined there, and how much is imported from the United States? A. For 1898 the percentage of Canadian was 61.1 and the percentage of imported, which is altogether American—no oil is brought from elsewhere—was 38.9 of the consumption in Canada. In 1881 there was only 6.9 per cent. of American and 92.1 of Canadian.

Q. (By Mr. Smyth.) How do the total quantities compare? The percentages vary; are the total quantities any larger? A. Much larger. In 1881 the number of gallons of Canadian was 6,406,783, while in 1898 it was 10,796,847 gallons.

Q. (By Mr. Jenks.) The Canadian output is also largely on the increase today; the demand simply outruns the supply, so you are getting more and more from the United States? A. Yes.

THE COURSE OF PRICES.

Q. Can you give us some information on the course of prices for the last three or four years, so that we can see whether the purchase of these companies by the Standard Oil Company has had any effect on them? A. I have invoices here, dating all the way back to 1892, of the old Imperial Company, which is at the present time the Standard. In September, 1892, they were selling oil for 12½ cents delivered in St. Johns, Quebec.

Q. That is the refined product? A. Refined, in barrels. The cost of barreling and inspection is estimated to be about 2½, say 2½; then that would mean that you deduct five cents from 12½, or 7½ in bulk f. o. b. Petrolia. In 1894 it was delivered in St. Johns for 11 cents; that is, in barrels, freight paid. I might say that the first was July, 1894, and in September, 1894, it was still 11 cents. In April, 1896, it was 14¾ cents delivered at St. Johns.

Q. That was before the Standard Oil Company took them in? A. Previous to that altogether. In September, 1897, it was 13¾, delivered in barrels; in May, 1898—that was just a month or two previous to the time they took control of it—it was 12½, today it is 17½ cents delivered in barrels at St. Johns.

Q. (By Mr. Clarke.) Do you know the prices of

crude petroleum between the 11 cent time and the 13 and 17 cent times? A. I will just give this to you here. I have them from a large producer of petroleum under date of October 30 last. In January, 1895, the price was $1.16 per barrel; in June, 1895, it was $1.53 per barrel; in January, 1896, $1.72; June, 1896, $1.70; January, 1897, $1.50; June, 1897, $1.40; January, 1898, $1.40; June, 1898, $1.40; January, 1899, $1.40; June, 1899, $1.45; and the present price is $1.60. I have the average price for this year, if you wish to have it; I have it here.

CRUDE OIL GOES UP ONE-HALF CENT A GALLON; REFINED, FOUR CENTS.

Q. (By Mr. Jenks.) Can you give us the prices of refined oil at the beginning of this year, 1899? What was the price of refined, compared with the price of the crude, at the beginning of this year? A. Well, I have no invoices that I could show you covering that time, but I have a memorandum here. This is a retail price. Of course, it is pretty hard to go by that. In January of this year it is quoted at 14 cents, and in February 14½.

Q. And the present price from that invoice was 17½? A. No; I have no invoice to the effect that 17½ cents is the price of oil today.

Q. And this decided change in price has been during the latter part of this year? When the price of crude was $1.45 per barrel the price of refined was down to 14 cents or possibly less? A. Yes. It is only recently that crude is $1.60; very recently.

Q. How long is it since refined went up to 17 cents? A. That is very recently, too.

Q. Then the facts seem to be these: That the price of refined has gone up at about the same time as the price of crude? A. Nearly so.

Q. You would say it ran up proportionately, or nearly so? A. I am not familiar enough with the refining; I do not know enough about that.

Q. They have simply gone together? A. Yes.

Q. (By Mr. Phillips.) Has the price of crude in Canada corresponded with the recent great advance in Pennsylvania and Ohio oil within the last six months or a year? A. I do not know just what the prices have been in Pennsylvania or Ohio; but up to June of this year crude was only $1.45 at Petrolia and even lower than that.

Q. But you can not give us the price of refined in June? A. June of this year?

Q. Of this year, that is, the wholesale price? A. Yes, I have it. In June here; well, the retail price, 13½ cents. These, of course, are one cent over the Wholesale prices.

Q. Well, that 13½, then, corresponds with $1.45 and this 17½ with $1.60. Is it claimed by any one that this increase in the price of the refined oil is due to the control of the refining by the Standard Oil Company? A. It is claimed so by everybody or nearly everybody.

Q. And do they make the same claim as to the increase in price of crude; that the Standard Oil Company has put up the price of crude? A. Well, no. I might say that it pays the Standard Oil Company much better to refine Canadian oil and force it on the Canadian market than it does to import, because there is an import duty of five cents per gallon, and you can readily see it is far better to pay a little more for crude and force the people to use the Canadian product.

FREIGHT DISCRIMINATION BETWEEN AMERICAN AND CANADIAN OIL.

Q. There have been some charges made in the papers for the last few months that there have been freight discriminations in Canada in favor of the Standard Oil Company. Can you give us any information on that subject? A. The Sun Oil Refining Company, limited, of Hamilton, Ontario, and ourselves laid a complaint before the railroad committee of the privy council regarding this matter some time in January last. The complaint was heard by the railroad committee in February. At that time we were complaining principally of the discrimination in freight rates on local shipments on Canadian oil as against American. We also complained on the through freight rates from Black Rock, where it enters Canadian territory to Montreal and other points. So far as that investigation was concerned the railways raised the objetcion that the railroad committee had no jurisdiction over foreign freight, or at least freight originating in foreign countries, though they decided afterwards that they did have jurisdiction over it. On the local freight rate they threw up their hands and admitted that they were in the wrong. It was a put-up job in the start, and it was about time they admitted it. For instance, I went out and bought a barrel of Canadian oil and shipped it to George L. Meikle Company, of La Shutte. On the Canadian oil I paid 77 cents freight. Taking barrels of 450 pounds, that was at the rate of 17 cents per 100 pounds. On a barrel of American oil I paid $1.08, a rate of 24 cents per 100 pounds. Here are the original bills of lading signed and receipted. I also shipped a barrel of each kind to St. Johns, Quebec. On the American oil I paid $1.08 for the barrel, or 24 cents per 100 pounds, and on the Canadian I paid 54 cents, or 12 cents per 100 pounds. A more glaring injustice never existed.

Q. When you delivered this oil to the stations—

A. (Interrupting.) We had to say whether it was American or Canadian.

Q. They simply made up the freight bills accordingly? A. They made up the freight bills accordingly, and you had to mark on the freight bills whether it was American or Canadian.

Q. What had been the custom before? Had they been shipping at the same rate? A. Yes; whether American or Canadian, it was shipped in the same way at the usual rate of freight.

Q. And this is simply a rating made by these roads? A. Yes; and we think at the instigation of the trust to prevent us from marketing our goods at local points. Not satisfied with marking up the through rates they wanted to cripple us further by charging double for American over Canadian.

Q. Why do you think that the Standard Oil Company was back of that? A. They have got control of

the Canadian business, and they were anxious to force people to use Canadian oil by making it impossible to get American oil.

Q. (By Mr. Clarke.) Were both of these over the Grand Trunk? A. No, sir; both over the Canadian Pacific.

Q. (By Mr. Jenks.) On what roads were those discriminations made against oil? A. Both roads.

Q. On any others? A. We have a number of small railways, but the Grand Trunk and Canadian Pacific railways are really the only roads you might say, that we shipped by; in fact, they are the only roads running into Montreal. There are others running in there, such as the New York Central, Delaware and Hudson, and some others, but they come in over the Grand Trunk tracks or the Canadian Pacific.

THE MICHIGAN CENTRAL LOSES STANDARD BUSINESS.

Q. How about the Michigan Central? A. They come as far as Hamilton, but not any farther.

Q. Was there any discrimination made to Hamilton and through that part of the territory? A. I might say the Michigan Central would not go in for increasing these freight rates. You might call it a deal, whatever you like. The exact result—they told our people that the Standard Oil Company trust had taken all their freight away from the Michigan Central. Nothing is billed over the Michigan Central, and the Michigan Central is still giving us a decent freight rate, what it was formerly, previous to October, 1898.

Q. You think there was a formal agreement between the Grand Trunk and Canadian Pacific to put up the freight on oil, but none of the other roads came into the agreement? A. No, none of the others came in; no other had anything to say about the matter; they were the only ones that could bring it into Montreal and other points the only two through lines we have.

Q. You say you are informed by the Michigan Central Company that the Standard Oil Company have taken away their business since this. Did not that information come from one of the officials or from some one in authority? A. It did, although I am not prepared to say who it was from.

SUPPOSED SPECIAL RATES TO THE STANDARD—COMPLAINTS TO THE CANADIAN GOVERNMENT.

Q. Will you explain somewhat further in reference to through freight rates? A. Of course we were not satisfied with the way the matter was handled in February last, so we made a further complaint to the railroad committee.

Q. Will you be kind enough to read this complaint and put it in evidence so that we can have it exact? A. I will. I might say I took this matter up with Mr. Blair, minister of railways and canals, and he wrote me on May 15 last as follows:

OFFICE OF THE MINISTER OF RAILWAYS AND CANALS.

Ottawa, May 15, 1899.

Gentlemen: I have your favor of May 12 before me and note its contents. If you have found any good reason to believe, as I infer you have, that the C. P. R. and the G. T. R. are carrying the Standard Oil Company's products at a lower figure than they are proposing to charge you, and if you make such an allegation and ask us to investigate it, the railway committee will summons such witnesses to Ottawa as you may think, or we conclude, will on oath be compelled to acknowledge the facts. We will not permit the C. P. R. or G. T. R., or any other railway to tell us that it is none of the business of the public to ascertain whether there is discrimination or preference. It is essentially our business to see that it is not permitted. I will have the deputy minister ascertain, beyond this, whether there are any facts in his possession with regard to the tariff, or which he can procure, of which I can acquaint you.

Yours faithfully,

ANDW. G. BLAIR.

Gall-Schneider Oil Co., Montreal.

The witness (reading statement). Now, this is our complaint:

To the Railway Committee of the Privy Council:

The complaint of the Sun Oil Refining Company, limited, and the Gall-Schneider Oil Company, limited, with reference to the tolls charged by the Grand Trunk Railway Company, of Canada, and the Canadian Pacific Railway Company, upon petroleum and its products, humbly showeth—

Your complainants are companies incorporated under the laws of the Provinces of Ontario and Quebec, respectively, for the manufacture and sale of petroleum and its products, and have their places of business and manufactories at Hamilton and Montreal, respectively.

Your complainants necessarily import from the United States large quantities of petroleum and its products.

According to the uniform classification of freight prescribed by the governor in council under the railway act, and now in force, illuminating oil and lubricating oil in wood are classed as fifth class for car lots and third class for less than car lots.

1. The said railway companies under like conditions and circumstances are naming unjust and partial discriminations between different localities.

2. The said railway companies are giving secret special toll rates, rebates and concessions to the Standard Oil Company and persons and corporations affiliating with them on freight carried over their respective roads.

3. The said railway companies have been since October last, and are at the present time discriminating with regard to freight rate charges in favor of the Standard Oil Company and others affiliating with them against independent shippers and all oils shipped by the Standard Oil Company and said other persons and companies from all points in the United States coming into Canada are carried at a less rate of freight than the same class of goods shipped by the independent refiners competing against the Standard Oil Company and said other companies.

4. The said companies are at present and have been

since October 1 last charging 35 cents per 100 pounds from Buffalo and Suspension bridge to Montreal, as per their tariff issued at Montreal, while they charge only 25 cents per 100 pounds from Sarnia to Montreal on the same class of goods, notwithstanding the fact that the distance from Sarnia to Montreal is 77 miles more than that from Suspension bridge to Montreal.

5. On all oil shipped from Buffalo and Suspension Bridge to Montreal by the Standard Oil Company and its connections the said railway companies are giving a secret rebate or reduction.

6. Shippers not connected with the Standard Oil Company and its connections are charged on shipments from Suspension Bridge to St. John, New Brunswick, on carload lots, 45 cents per 100, while shippers from Sarnia are charged 30 cents per 100, although the distance from Sarnia is 77 miles greater from Suspension Bridge to St. John, New Brunswick.

7. On all other points on the international boundary to which shipments of oil are made the same discrimination was made in favor of and rebate given to the Standard Oil Company and companies and persons affiliating with them, against their competitors.

8. By reason of the facts herein complained of, your complainants have sustained loss and are greatly impeded in the transaction of their business.

9. Your complainants therefore submit that an order should be made directing the said railway companies to discontinue those illegal acts, and to refund all overcharges which they have so collected from your said complainants.

And that such further order may be made with reference thereto as to your committee may seem and the circumstances of the case may require.

And for the purpose aforesaid full inquiry into the matters herein complained of may be made.

Dated at Hamilton, June 7, 1899.

The Sun Oil Refining Company of Hamilton, Limited.

The Gall-Schneider Oil Company, Limited,

By Staunton & O'Heir, their Solicitors.

Q. (By Mr. Jenks.) I note that you speak of secret rebates that have been given to the Standard Oil Company. Did you have any positive proof that secret rebates had been given? A. We hope to be able to establish the fact if we get the right men before the railway committee. I have good reason to believe and do believe that such is the case.

Q. But as yet you have not brought that out? A. As yet I have not yet brought that out

Q. Does the Standard Oil Company ship any American Oil into Canada? A. They do; but very little in comparison with former years.

Q. Their expectation, apparently, is to supply the Canadian market with the oil there, in which there is the largest profit? A. Yes; so long as the duty remains as it is.

Q. Have you any reason to think that for the American oil which they do ship into the country they pay any less rate of freight than you do? A. I certainly do, and I have a good reason to believe so.

Q. The main charge, however, is this, that discrimination is made between American and Canadian oil to the detriment of those people who are dealing in American oil? A. No; we do not charge that exactly. We charge that the Standard Oil Company and companies connected with them are getting a lower freight rate than we do, or at least than the independent shippers do.

Q. In every way and over all the roads? A. Well, very nearly; anywhere and everywhere.

Q. (By Mr. Farquhar.) You mean on Canadian oil? A. Any oil. There is nobody else handling Canadian oil except themselves. You can not buy a gallon of oil unless they see fit to sell.

THE STANDARD WILL NOT SELL IN CANADA EXCEPT TO THOSE WHO AGREE TO BUY ONLY FROM THEM.

Q. (By Mr. Jenks.) Do you know whether they refuse to sell Canadian oil to anyone; for instance, have you offered to buy? A. I have tried to buy, and they refused to sell .

Q. As a matter of fact you can not get any Standard Oil Company products to handle? A. We can not get any to handle unless we get it from an outsider.

Q. Does this same fact in reference to their refusing their products apply to the Sun Oil Company, of Hamilton? A. Yes; precisely the same.

Q. And all others except those formally recognized as their agents? A. Yes; those who buy exclusively from them.

Q. Have you any knowledge of that fact, that they insist upon their dealers making an agreement that they will buy only from them? A. Yes.

Q. You have positive information of that fact? A. They have asked me two or three different times —sent a man to us, and asked us to buy all our stuff from them and stop this inquiry and all that kind of thing, which, of course, we refused to do.

Q. (By Representative Livingston.) What inducement did they offer you to do it? A. Well, they wanted to charge us about twice what the stock is worth, and to cripple us as soon as they could; that was the inducement, but they did not put it in that form. They offered us no inducement whatever.

IS IT TO PROTECT THE CANADIAN INDUSTRY?

Q. (By Mr. Farquhar.) Is there evidently a policy on the part of the Canadian roads to build up Canadian oil as against the American product by making the rates they do? A. I asked Mr. Bosworth, general freight agent of the Canadian Pacific, and he replied that he wanted to protect the Canadian industry.

Q. Has not that been the plan of your government in making as much discrimination as it could against the American product? A. In past years it has

been; I can not say it has been under the present government.

Q. Is it not of advantage to the Grand Trunk and Canadian Pacific to take the through rate and a short haul on the Canadian lines with the Canadian market in preference to prorating with American lines in competition south of the St. Lawrence? A. It certainly is not; I can not see where it come in, because on oils it is only a distance of 75 miles less.

Q. (By Representative Livingston.) Is it not done as a retaliatory measure entirely? A. I do not think it is.

Q. (By Mr. Farquhar.) Has it not been the policy as announced in the Canadian press, and declared by your ministers, to take care of your products as against anything imported across the line? A. Well, it was previous to the present administration. I can not say such is the case at the present time.

Q. Do not the two roads there that are backed up by foreign capital, Canadian capital, and subsidized, uniformly make rates to the Canadians to the disadvantage of the Americans? A. That is what they have done, if you look at it that way.

Q. (By Mr. Smyth.) Does the Standard Oil Company produce crude petroleum in Canada? A. Well, men connected with the Standard Oil Company do. The Standard, as a company, owns very little

RISKS OF STARTING AN INDEPENDENT REFINERY—NOT MUCH RISK TO THE STANDARD.

Q. They are simply refiners, are they, in Canada? A. Yes.

Q. Can not any one buy that crude petroleum in Canada? A. They can; yes.

Q. And they could refuse if they wanted to? A. If they felt so inclined they could.

Q. Then when you say no one can buy Canadian refined oil except with the permission of the Standard Oil Company, is it because they do not choose to refine it? A. Anyone who is familiar with the Standard's operations in the past would think twice before he put up a refinery in Sarnia, or any where, to refine Canadian oil.

Q. (By Representative Livingston.) If they did, tell us what the Standard Oil Company would do with them, judging the future by the past? A. I suppose they would lower the price at certain points and run them out of busines as fast as they could. Then there is the uncertainty about the duty. The government, it is expected, will remove the whole or part of that duty, and if they did, a refinery in Canada would not be worth much.

Q. (By Mr. Smyth.) Then the Standard Oil Company in buying those refineries in Canada have taken a very high risk if they gave $65,000 for a refinery that was only worth $10,000? A. They have made that ten times over in the last three months.

Q. (By Representative Livingston.) They have the railroads in Canada subsidized or under their control, have they not? A. I think they have.

Q. Then they do not take much risk? A. I do not think they do.

Q. (By Mr. Smyth.) They take the risk of the tariff, and you think no one would invest in the refinery? A. That is, an outsider. The Standard Oil Company is a different concern altogether from any private individual. It is not run on what are known as business principles at all; at least, not what might be called honorable.

CRUDE OIL HAS BEEN HIGHER—REFINED WAS NEVER SO HIGH.

Q. Do you consider that the price of crude oil has advanced to $1.60 as against $1.40 and $1.30? A. Of course, as I said before, I do not know much about the refining part of it, but it strikes me that a difference of 20 cents a barrel does not warrant an advance of 5 or 6 cents a gallon on the refined product.

Q. But it has only been advanced from 14½ cents; that is not 5 or 6 cents a gallon? A. But in past years crude oil has been a great deal higher than it is; and the price of oil never was known to be as high. I do not remember of oil being as high as it is today. In 1896 crude oil was as high as $1.72, while oil was selling for 14½ cents delivered in Montreal.

Q. Do you think there is any profit in it? Were not business conditions very much depressed in 1896? Is there not very much more margin of profit in all business today as compared with 1896? A. There is for some people, the Standard Oil Company in particular. We do not find it so.

Q. Now, do I understand you that the Standard Oil Company is the sole buyer of crude oil in Canada? A. They are.

Q. And yet they have advanced the price from $1.45 to $1.60? A. Yes; that is done to encourage production, because they find, as I explained before, that it pays better to refine Canadian than it does to import the American. They want to increase the production because it pays them much better to do so.

Q. Have they not really bid against themselves in raising the market price from $1.45 to $1.60 for crude? A. They have.

Q. (By Representative Livingston.) But you say while they have done that they make more money by it? A. They certainly do.

Q. (By Mr. Smyth.) At the same time the producer of crude petroleum is getting 15 or 20 cents more per barrel than he got before? A. But he is getting 12 cents per barrel less than he did in 1896, and the dealer is paying 2½ to 3 cents a gallon more for his refined oil.

Q. That may be, but the business conditions may be different. A. Yes; they are. It is the Standard Oil Company that is running the business now; that is the difference.

PRODUCERS VERSUS CONSUMERS.

Q. (By Mr. Phillips.) Do you state that the Standard Oil Company had to put up the price of oil in order to induce development? There are a

large number of persons outside of the Standard Oil Company that are engaged in the producing business in Canada. A. Yes.

Q. Do we understand, then, that they put up the price of oil in order to increase production, because there was a much larger profit in refining Canadian oil than in importing American oil? A. That is precisely the idea, as I understand it, and as it is generally understood; that they advance the price because it pays them so much better a profit to refine the Canadian product than to import the other, because there is a duty of 5 cents.

Q. (By Mr. Smyth.) But the effect in the oil producing regions has been beneficial? A. Yes.

Q. It has caused more wells to be drilled? A. Yes. There is a market for much more oil in Canada than is produced there, and they want to benefit by it, I suppose.

Q. But the people are benefiting by it also, are they not? A. Some of them, I suppose, do, and some do not.

Q. Well, they are producing more oil and getting a higher price for it? A. I do not know that they are producing more oil. They may be, but, anyway, up to 1898 the production was about even.

Q. (By Representative Livingston.) How is the consumer faring while that is going on; is he getting his oil for less money and making money by it? A. No, sir.

Q. What is the ratio between the producer and the consumer as to population, as to numbers. A. I do not know how many producers there are; there are quite a number of them, but I would not undertake to say.

Q. About 1 to 100? A. No; not 1 to 10,000.

Q. Then where one in 10,000 is making money 9,999 are losing it? A. Well, they are paying a good deal more for their light.

THE TARIFF ON OIL.

Q. (By Mr. Farquhar.) How long has this 5-cent tariff rate been in existence? A. It used to be 7 and 6, if I remember right, although I am only taking it from memory; I think it was the late Conservative government that reduced it to 5; that would be the last session, in 1896. The present Liberal government said they were going to wipe out all these iniquities. They may be going to do it, but they have not done it yet.

Q. So the remedy lies with the Canadians in establishing a tariff that will admit American oil and bring the Standard's price down? A. The remedy lies in that and in obliging the railways to carry petroleum products at a reasonable freight rate.

Q. You would say that these Canadian railroads, through establishing these tariff rates, discriminating in favor of Canadian oil, are carrying out the policy of the Canadian government, whether it is Liberal or Tory? A. No, sir; most decidedly not.

Q. You think not? A. No, sir; I think they were carrying out the policy of the Standard Oil Trust I do not think it emanates from any other source.

Q. Then you would say that if they charge that 5-cent rate, and do not lower it to 3 or 2, and allow competition, the Canadian government is really in aid of the Standard Oil Trust? A. Of course, that has been standing for a long time—this duty. If they would remove that it would help us greatly, but while they allow the railroads the monopoly of freight rates I do not know where they may put them to.

FREIGHT DISCRIMINATIONS (RESUMED).

Q. (By Mr. Jenks.) Do I understand you to say, in regard to local rates in Canada itself, that the railroads had all been compelled to put back the rate and make it the same on American oil as on Canadian? A. Yes; they did.

Q. And the only discrimination now that remains against you in the Canadian rates is on the oil that is imported, on which there is a through rate from the United States? A. Yes. Of course if we can not get through rates on the oil our stuff does not reach a local rate town, and it doesn't amount to "shucks."

Q. (By Mr. Smyth.) Have you evidence as to the rates of freight charged the Standard Oil Company from the United States into Canada, as compared with the rates you and other independent dealers in oil have to pay? A. We have proved nothing yet. The railways say the freight is alike to them and all others, but we don't believe it, and we hope—in fact, we believe—that we can prove that such is not the case when we are given an opportunity to do so.

WAGES.

Q. (By Mr. Jenks.) Have you any information with reference to the rates of wages that are paid by the Standard Oil Company in their refineries as compared with the rates that were paid before? A. No; I know nothing about that, except that I did hear that their men were complaining in Montreal, at their establishment there, that they had reduced their wages. Beyond that I have no definite knowledge.

Q. (By Mr. Farquhar.) Your last answer was hearsay; you know nothing about it? A. Yes; from the men I know nothing about it.

INDEPENDENT IMPORTERS IN CANADA AND WHERE THEY BUY.

Q. (By Mr. Phillips.) Do the independents in Canada import more American oil into Canada than the Standard? A. I do not know. I should not want to say that they import more, but the importations into Canada by independents have been largely increased during the past fifteen months.

Q. What refining companies in the United States, independents, export or import their oil? A. The Sun Oil Company and ours are the chief importers in Canada, and, in fact, the only ones I know of at the present time. We import all our stuff, or nearly

all, from the Corn Planter Refining Company, in Warren, and the Warren Refining Company, in Warren, Pa. We also import some from the Craig Oil Company, in Toledo. We bought a good deal from the Paragon Refining Company, in Toledo, and we have bought some from Scofield, Shurmer & Teagle, in Cleveland, I think.

AMERICAN OIL BETTER THAN CANADIAN, AND PENNSYLVANIA BETTER THAN OHIO.

Is this oil that is bought by you, the independent oil, considered better than the Standard or equal? A. From what I can learn from the consumers, the oil that we have been selling as American oil, which it was, is considered much better than what the Standard was selling them as Pennsylvania oil. As a matter of fact, I think they had been giving them for years the Ohio product and putting it off as Pennsylvania oil, although I have nothing to prove that by,except the people have said that they considered what we were giving them far better.

Q. At the same price the citizens of Canada would buy of the independents in preference to the Standard, would they? A. Every time. There is not one instance in 1,000 but they will give us the preference over the Standard.

Q. You speak of importing oil from Toledo, Ohio. That is what is called Ohio or Lima oil, is it? A. I think so.

Q. Do you sell that as Ohio oil? A. Oh, yes.

Q. And you make a difference in price between the Ohio oil and the Pennsylvania oil? A. Oh, yes.

Q. You sell them for what they are? A. For what they are. We sold the Ohio oil last fall—that is, about this time last year—at precisely the same price that they were selling Canadian oil at. We were paying those excessive freight rates and five cents duty, but we still sold it at preceisely the same price that they did, and we did not lose anything by it, although I admit we did not make much.

Q. (By Mr. Smyth.) The Canadian public would not pay you more for that oil? A. They would at that time, but they would not sometimes; but we did not want to ask them any more at that time.

Q. Is it not recognized in Canada among consumers that the American oil is better than the Canadian oil? A. It certainly is.

Q. And yet they will not pay more for it? A. They will; but at that time we were not asking more for it.

Q. (By Mr. Jenks.) What difference do you make in prices between the Pennsylvania product and the Ohio product? A. Well, generally about a cent or a cent and a half.

Q. (By Mr. Smyth.) Do you sell much Pennsylvania oil? A. Yes; we sell a lot of it.

Q. The parties you mention that you deal with were mostly Ohio people. Whom do you buy from in Pennsylvania? A. From the Corn Planter Refining Company and the Warren Refining Company. I might say that the men who are interested in these two companies are also interested in our concern in Montreal, and also in the Sun Oil Refining Company, in Hamilton. Mr. Jameson is a shareholder in our company, and so is Mr. Todd, of the Corn Planter. They are also shareholders in the Sun Oil Company, in Hamilton.

CANADIAN OIL DUTY DISPROPORTIONATELY HIGH.

Q. (By Mr. Clarke.) You think that the Canadian duties on American oil are disproportionately high; that is, higher than the duties on other products that are imported? A. Oh, yes. Take, for instance, the oil that we bought in Ohio last year. It was worth about, say, 3 cents a wine gallon, and the duty was 5 cents a gallon on it. Of course, today Ohio oil is worth considerably more money, but the duty is still very, very high. I know of nothing in the whole list—there may be some things—but I know of nothing that compares with oil. And Mr. Fielding, in his budget speech last year before the house, said there was nothing he had any apology to offer for but coal oil. He did mention that, and said that he regretted he had not been able to remove any duty from that then. It was the only thing he apologized for, which would go to show that there was nothing else to compare with it.

Q. Have you figured out what the percentages of duty on oil and on other products would be A. No; I have not; but the duty generally goes all the way from 10 to 25, 30, and even 40 and 45 per cent; and even if it went to 50, it is still away behind the oil. I do not know of anything that comes anywhere near that.

Q. (By Mr. Conger.) What is the percentage on the oil, approximately? A. That would depend largely on the cost. We pay 5 cents a gallon regardless of the cost, unless it is an oil that costs over 25 cents a gallon; then we pay 25 per cent. Of course you know there are no oils sold for 25 cents, or very little, and hence we are not much concerned with that.

Q. (By Representative Livingston.) What is the price of crude oil in Ohio? A. I do not know.

Q. What is the price of the crude oil that you buy this side of the line today? A. We do not buy any crude oil; it is the refined only that we buy.

Q. What is the price of the oil you buy? A. We have bought some for 3, 3⅜, and 3¼, and lately we bought three tanks that cost us, if my memory serves me right, 5¼.

Q. Then, at five cents' tariff, what is the percentage; isn't it over 100 per cent? A. Well, that is over 100 per cent.

Q. (By Mr. Clarke.) What was Mr. Fielding's reason for being unwilling to propose a reduction of the duty on coal oil? A. As nearly as I can remember, he merely said that everything and everybody was prosperous or was prospering, and it was not advisable at that time to disturb any of the other industries, and hence he had not done anything with the coal oil duty, because it would have been the only one that he would have wanted to touch at that time.

Q. It is a fact, is it not, that the Canadian gov-

ernment derives a considerable revenue from the importations of oil? A. It does.

Q. And it needs that revenue—depends on it largely for government expenses?

Q. (By Representative Livingston.) Does the Canadian government want that tax for revenue, or what do they want it for? A. That particular tax?

Q. Yes. A. I do not think it needs it; I do not see why it does.

Q. (By Mr. Clarke.) Do you not think the ministers consider that they need it? A. From Mr. Fielding's own remarks I should not say that they thought they needed it. He did not say anything about it at that time.

Q. (By Mr. Smyth.) Do you know how much it amounts to a year to the Canadian government? A. No; I could not tell you. I suppose you could find out from this [producing book]. In 1898 there were 6,880,734 gallons, at 5 cents a gallon; just what that would amount to I have not figured out.

COST OF OHIO OIL, FREIGHT AND DUTY PAID, AND BARRELED.

Q. This oil that you bought in Ohio, you say, at 5 cents a gallon; what is the freight on it to Montreal? A. Forty-three cents per 100, at the present time.

Q. How much would that be on a gallon? A. I figure that it costs us 3 1-3 cents on an imperial gallon.

Q. That would make it cost 13 or 14 cents? A. It costs us more than that when we count the cost of barreling it. We have to barrel it, of course. After the 1st of October, 1898, they did charge us as high as 46½ cents from Toledo, and previous to that time the rate from Toledo was 29½ cents. We pay 43½ cents from Warren to Montreal; and before the Standard got control of the market we got a rate as low as 23 cents—that was no later than April, 1898—23 cents from Warren. But when you go and ask the railway people anything about it, they simply will not talk to you; they do not throw a man out, but they do the next thing to it; they will not have anythting to say about it.

Q. You really could not sell that oil below 17 cents and make a profit on it after paying that high freight and paying the duty? A. No; we can not sell it at that price today.

Q. The freight is double what it was a few years ago? A. Almost.

Q. Forty-three and 23? A. Forty-three is what they charge from Toledo now, although they did charge us as high as 46; and from Warren, which was as low as 23—that was in April, 1898—it is very nearly double.

Q. Then, one reason why the price of oil is higher in Canada today is the high freight charges? A. Yes.

Q. And with the duty and the cost there is not very much profit in it at 17 cents? A. There is no profit in it at 17 cents. We can not sell any Ohio oil at 17 cents. I figured it out. In barrels it costs us 17 cents an imperial gallon; so we can not do anything with it. We can not sell it for less than 18 or over, and make anything on it.

SUPPOSED DISCRIMINATION IN FAVOR OF THE STANDARD.

Q. Do you blame the Standard Oil Company for all that increase in the price of refined oil? A. I do, so far as freight is concerned.

Q. You think they instigate that high rate feight from Toledo and Warren? A. Yes. We knew nothing about this, mind you, from the railway companies. They are supposed to give due notice or post a notice in the stations, etc., as regards an advance of freight or any other notice of that kind; but we knew nothing about that. I heard of it first from our people in Warren. They had got hold of it some way or other—I do not know how—and I went up and for ten days I tried to find out from the Canadian Pacific Railway what the freight was going to be, what the increase was going to be, and I could get no satisfaction whatever. It was in the afternoon of September 30, 1898, about half past 3, that they told me what the rate was going to be, and the Standard knew all about it, because their man was running around the office there as though he owned the office. Nobody else could get anything. They would tell you that they had no time; they would not talk to you and they would not listen to you about it. We could not get any information, although they knew all about it.

Q. That is your supposition, that they knew anything about it A. Well, I know as nearly as I know anything that they knew about it, because they got a large lot of oil in at that time, before these freight rates came up. Just why they brought that in I could not make out; but they must have known. Any amount of it came in about the 30th of September and along about the 1st of October, which must have been on the way at that time.

Q. You think that the Standard Oil Company pay the same rates from Pennsylvania and Ohio that you do? A. No; I certainly do not; I do not think anything of the kind. The railways say they do, but I do not believe it.

Q. You think they absolutely pay it and there is a rebate? A. Yes.

WATER ROUTES.

Q. (By Mr. Jenks.)Is any oil shipped in by water from Toledo? A. Last year we had a lot of contracts on hand, and we had to fill them in some way. We could not bring in oil by rail to fill them, because the rate from Toledo to Montreal was advanced from 29½ cents to 46½ cents per 100 pounds, on October 1, 1898; and the only notice we had was given to us at half past 3 in the after noon of September 30, 1898. We brought in a schooner load of 1,500 barrels to fill our contracts. That was about the only barreled oil of any account that came in that way. The Standard are now bringing in refined oil by water in tank vessels. They have been doing that for the last three or four months.

Q. (By Mr. Conger.) Where do they bring that from? A. I think the American oil is loaded in New York, because it comes up the St. Lawrence river. The Canadian they load at Sarnia, and bring it down through Lake Ontario and the St. Lawrence to Montreal.

LUBRICATING OIL.

Q. (By Mr. Phillips.) Do you handle any lubricating oil in Canada? A. Yes; that is the greater part of our business. We were forced to handle the lubricating oil almost exclusively, because we could not handle the other after the railways began manipulating the freight rates.

Q. Where do you buy lubricating oil? A. Nearly altogether from Warren, Pa., from the Warren Refining Company and the Corn Planter.

Q. Is there any lubricating oil made in Canada out of Canadian oil? A. Yes.

Q. Can you state the amount? A. There is quite a lot of lubricating oil made.

Q. Does it make as good a quality as you get from this country? A. No. Of lubricating oil and tar there was made in 1898 868,957 gallons. That is much less than in 1896. In 1896, you will notice, it was 1,447,455. It has gone back nearly half. That, I think, is due to the fact that they find the American product much better than the Canadian; I do not know of any other reason.

Q. Perhaps they are refining more of the Canadian oil on account of the tariff? A. Well, I do not know; the tariff was a little less in 1898 than it was—well, in 1896; it would just depend in 1896 on what time that stuff was brought in. There was nearly one-half more used in 1898 of the American than there was previous to that time; and there must have been a great deal more oil consumed in 1898 than there was in 1896, because it was increasing all the time. There are new industries and that kind of thing going on.

FREIGHT RATES RAISED BY CANADIAN ROADS, NOT BY AMERICAN.

Q. (By Mr. Farquhar.) Was there any other reason given at that time for the raising of the American freight rates on the roads that were prorating with the Canadian; did they give any business reasons for it? A. No; the American roads did not increase their freight rates; our own Canadian roads did.

Q. On the through bill they added the Canadian tariff? A. Yes, or they increased the tariff so much and made it up to what it is at the present time. The rate from Warren to Suspension Bridge is still 8½ cents; it was that before and it is yet; but the rate from Suspension Bridge to Montreal is 35 cents, making a through rate of 43½. The American roads remain precisely the same as they were before.

SAMPLING COMPETITORS' OIL AND KNOWING COMPETITORS' BUSINESS.

Q. (By Mr. Jenks.) Have you any further statement that you would like to make on any points that have been omitted? A. When our tank cars come in, the Standard Oil Company have a habit of sending their man and opening that tank car and taking a sample out of it to see what it contains. I have known this for a long time, but it was only a little while ago that I was able to bring them to time for it. They did it regularly, and I had hard work to catch them. Of course we were not wasting all our time standing along the siding looking after our cars, but I got them one day and I called their attention to it and they said it was a mistake. I had a letter from our foreman at Mile End complaining of the fact; however, that is no matter. They would take a sample down to their office and find out just what we had and deal with us accordingly. As a matter of fact, before I went into this company, before it was organized, we used to buy an occasional carload of American goods. That was before the Standard got control of the Canadian business. There were some American oils that we had to have any way, because they were better. And I remember one day that the Standard Oil Company's man came into the office, and he gave me the numbers of the cars and the number of barrels contained in them and what I paid for them. I knew him very well, and he jokingly said, "I know all about it;" and he wanted to sell me the stuff. Well, how he knew it I must confess is beyond me.

Q. (By Mr. Smyth.) Do they open your letters? A. Oh, no. (Laughter.)

Q. (By Mr. Kennedy.) Are these employes and officials of the Standard Oil Company Canadians or Americans? A. I do not know; I will give that up, too.

Q. (By Mr. Smyth.) The opening of your tank cars must be done with the connivance of the officials? A. No.

Q. (By Mr. Kennedy.) Do you know the nationality of the Standard Oil people in Canada- A. Some of them have been brought from here, and some of them are Irish, and others are Scotch; but whether they are British subjects or otherwise I do not know.

Q. (By Mr. Smyth.) Do you think the railroad officials must have known of these cars being opened and samples being taken from them? A. They did, but, like myself, the agent at Mile End, where my stuff had come in—he knew it was going on, and he never had been able to catch them. When, however, our man found them at it he went and got the agent and brought him out, and showed him the man on the track. Corn Planter was written on the car in letters at least 18 inches long, and he never could have made any mistake about the tank; but they said it was a mistake. He got on the wrong tank. Of course, that was all right, as far as an explanation goes. Then they will persecute a man in every

shape, manner and form. They will send a man or men around to watch where you are delivering oil, and then they will send their salesman right there afterwards, and all such kinds of things. They do anything and everything. There is nothing but what the Standard Trust will do; I do not care what it is.

Q. (By Mr. Clarke.) You think, then, that they practically run your railroads and your government? A. At the present time I will not say that much about the government, because I expect to have these things regulated a little; but they run the railways, that is sure.

Q. (By Mr. Smyth.) How long have you been in the oil business? A. About eleven years.

Q. How long since the Standard Oil Company has had control of Canadian oil? A. Since the latter part of July or the beginning of August of last year.

Q. (By Mr. Farquhar.) Previous to that, were they open competitors there in the refining and sale of oil? A. Yes. There were five separate refineries, different concerns, in active operation at that time, and four others that were not active then.

FREIGHT RATES AGAIN.

Take the freight on other lines of goods. The Lake Shore tariff, No. 193, in April, 1895, shows sixth-class articles, carload iron, 21½ cents per 100 pounds from Pittsburg to Montreal. In September, 1899, the rate is 19½, showing a decline of two cents per 100 pounds. I do not know why it went up on oil. I know why, but there is no reason for it. I offered to guarantee them 400 tank cars a year—made the offer in writing to the Grand Trunk. The reply was this, dated the 5th of July, 1899:

"*Freight rates on oil.*—Replying to your favor of the 30th ultimo and previous conversation, I have now had an opportunity of discussing this matter with our general traffic manager and beg to advise you that we are not prepared to make any modifications on our present rates for oil.

"Yours truly, J. W. Loud."

They simply will not listen to you at all or give you any satisfaction whatever. These same railroads have been built largely with the people's money. The Canadian Pacific railway, for that western extension through to Winnipeg and the coast, have got some 20,000,000 acres of land and about $30,000,000 in money; and the land is worth all the way from $3 to $10 an acre today in Manitoba and the northwest. It gives you some idea of whether that road cost them very much or not.

Q. (By Mr. Smyth.) You do not think this is altogether political action on the part of the Canadian government, influencing the railroads, in the way of retaliation, to keep out American products? A. I do not think anything of that kind. I have not any such idea at all, and I do not think anybody else in Canada has.

Q. You do not believe the railroads get all the freight they charge? A. No; I do not. I think part of it goes back to the Standard Oil trust; that is my opinion.

Q. But you have no proof of that? A. We have not. Of course there are lots of things we have got that I could have given you more information about if I had come before you later; but we have not proved these facts yet. We are sure enough that we have got information, but it is rather a serious thing to do that unless you know you are right.

Q. (By Mr. Farquhar.) As far as you know, then, you have to pay practically the same freight as the Standard? A. The railways say that.

Q. So far as you know, I say. A. So far as I know.

CANADIAN RAILROAD LAW—POWERS OF THE RAILWAY COMMITTEE.

Q. (By Mr. Smyth.) Is there any law in Canada against rebates by railroads? A. Well, yes; I do not know what it is, but they have laws governing these things; but the trouble is there, as it is elsewhere, it is pretty hard to handle these things and enforce them. You just fancy a concern of no more magnitude than our own tackling the Grand Trunk and the Canadian Pacific on questions of that kind.

Q. (By Mr. Farquhar.) You spoke of the railway committee. Do you know what scope and power that committee has? A. Well, they have, as near as I know, control of all such matters as freight rates, crossings of railways and passenger rates, and in fact anything of that nature that concerns the general public and the railways.

Q. Are their findings and judgments final? A. No; I think it is merely a court of inquiry.

Q. Investigation? A. Yes, and they can order the railway to do so and so; but I do not for a moment think that if we prove all that we have said, the Canadian Pacific railway or the Grand Trunk either will obey that decision. We should have to go to work then, I suppose, to have it enforced, which would mean a long time, and be of practically no use to us at that time when we got it.

Q. (By Mr. Phillips.) Enforce it through the courts, you mean? A. Yes, we should have to begin a civil action against them on the strength of the findings of the railway committee, because I do not think they would pay any attention to the railway committee.

COMBINATIONS FEW AND SMALL IN CANADA—SENTIMENT AGAINST THEM.

Q. (By Mr. Kennedy.) Is there any sentiment in Canada against these large industrial combinations? A. There is, and the Globe newspaper, which is supposed to be the official organ of the present administration, has been hammering away at industrial combinations, particularly the Standard Oil trust.

Q. Have you industrial combinations in Canada similar to those in this country and England? A. Oh, we have not anything of any account. The oil business is a kind of a monopoly and so is the sugar business; but that is due to the duty, and so on. There

are a few of what we might call monopolies or trusts, but they are very insignificant and small. They do not amount to anything outside of the oil business. It is something new to our people there, that kind of thing, and we have to thank the Standard Oil Company for introducing it.

Q. Are the people disposed to seek redress through legislation? A. I think that if the present government do not alter things in some way so that the people will not be at the mercy of these trusts, or the oil trust in particular—well, I think that that will be one means of defeating them at the next election. That is about the only thing that is spoken of; this freight discrimination and the duty on oil and binder twine and a few things like that. I might say that the present government said that if it was shown that there was any inclination to a trust in any manner whatsoever they would immediately remove the duty on the articles complained of. They committed themselves in that way; so I made a declaration to the effect that there was a combination in the oil business, and it was read before the house at its last session. They were going to consider it and I suppose they are considering it yet. There was nothing done about it. This is the declaration that I made:

CANADA, PROVINCE OF QUEBEC, DISTRICT OF MONTREAL.

I, Andrew Downie Gall, of the city of Montreal, in the Province of Quebec, oil merchant, do solemnly declare that I am extensively engaged in the wholesale trade of coal oil, burning oil and other oils in the Dominion of Canada; that all the petroleum oil refineries in Canada at the present time are under the control of the Standard Oil Company or Standard Oil trust through the said company having acquired some outright and a controlling interest in others; that since acquiring the said refineries in Canada the Standard Oil Company, which is operating in Canada under the style of the Imperial Oil Company, limited, has closed up some refineries, demolished others and is operating only such as it sees fit; that no petroleum oil from Canadian refineries can be obtatined today unless it is procured from or through the Standard Oil Company or the Imperial Oil Company, limited, directly or indirectly; that it is quite apparent, and investigation will establish beyond doubt, that the said Standard Oil Company or the Imperial Oil Company, limited, has so acquired and controls said refineries for the purpose of forming, and they have thereby formed a trust or combination to unduly enhance the price of such oil and to unduly promote the advantage of the said company at the expense of the consumers; that the firm of which I am a member, and other firms engaged in the oil business are compelled to buy in the United States and import therefrom our supplies of oil to supply our customers and the trade.

And I make this solemn declaration conscientiously, believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of "The Canada Evidence Act, 1893."

A. D. GALL.

Declared before me at the said city of Montreal this 21st day of March, A. D. 1899.

[SEAL.] R. A. DUNTON, *Notary Public.*

Testimony closed.

Whereupon, at 3:55 p. m. the commission adjourned until tomorrow morning at 10 o'clock.

Washington, D. C., November 11, 1899.

TESTIMONY OF GEORGE RICE.

Independent Oil Producer, Marietta, Ohio.

The commission met at 11:15 a. m., Senator Kyle presiding. At 11:15 a. m. Mr. George Rice was introduced as a witness and being duly sworn testified as follows:

Q. (By Mr. Jenks.) Will you give us your full name and address? A. George Rice, Marietta, Ohio.

Q. What is your business? A. I am a moderate producer of oil at the present time.

PAMPHLET PREPARED BY THE WITNESS.

Q. (By Mr. Clarke.) Have you prepared, printed, copyrighted and published a pamphlet which purports to be testimony given, or to be given before this commission? A. I have.

Q. Were you under oath when it was prepared? A. No, sir.

Q. Was it known to any officer of this commission that such a pamphlet was being prepared? A. Yes; I notified Professor Jenks and also the secretary that I was getting up my testimony to be put in pamphlet shape; and I was also directed to send two copies here two days before the time I should appear, which I did.

Q. Were any questions asked of you or answered by you in the preparation of this pamphlet by members of the commission? A. No, sir. Not any of the members that I know of asked me anything in regard to the preparation of it.

Q. Was any schedule of questions sent you? A. No; nothing of the kind.

Q. Do you claim any right, then, to issue that pamphlet as in any sense authorized by this commission? A. No, sir; I do not claim that they have authorized me in any shape or manner to issue this pamphlet. I have published it and copyrighted it on my own responsibility.

Q. Did any member of the commission know or have any notice of the contents, or proposed contents of that pamphlet before you printed and published it? A. Not that I know of; no, sir.

Q. You do not claim, therefore, that you have any right to in any way authenticate that by the use of the name of this commission? A. No, sir; I do not claim any authority from the commission for the use of it.

Q. That is all. A. I have not been authorized in any manner, shape or form.

Q. (By Mr. Jenks.) I understand that you have a statement that you are prepared to make of your own accord in reference to the business of the Standard Oil Company. You may make that in your own way, subject to such interruptions as the commission may think desirable.

The Witness. My testimony, in the main, is in pamphlet form and I will proceed to read from it. Page No. 3. (The witness reads as follows:)

"I am a citizen of the United States, born in the state of Vermont. Producer of petroleum for more than 30 years and refiner of same for 20 years, but my refinery has been shut down during the past three years owing to the powerful and all prevailing machinations of the Standard Oil trust, in criminal collusion and conspiracy with the railroads to destroy my business of 20 years of patient industry, toil and money in building up, wholly by and through unlawful freight discriminations. I have been driven from pillar to post, from one railway line to another, for 20 years, in the absolutely vain endeavor to get equal and just freight rates with the Standard Oil trust, so as to be able to run my refinery at anything approaching a profit, but which I have been utterly unable to do. I have had to consequently shut down, with my business absolutely ruined and my refinery idle. This has been a very sad, bitter and ruinous experience for me to endure, but I have endeavored to the best of my circumstances and ability to combat it the utmost I could for many a long waiting year, expecting relief through the honest and proper execution of our laws, which have as yet, however, never come. But I am still living in hopes, though I may die in despair."

The witness offered as exhibit the following:

"MAGNITUDE OF THE PETROLEUM INDUSTRY.

"The magnitude of the petroleum industry of this country may be inferred by its being first in manufacture and fourth in value of our exports.

"Its total production in the United States for 40 years—1859, when discovered, to 1898, inclusive—per government report, is 886,442,759 barrels of 42 gallons each. There was produced in the past five years—1894 to 1898, inclusive—279,129,467 barrels (about one-third of total), or an average of 55,825,893 barrels per annum, 152,947 barrels per day, inclusive of Sundays. The total average annual exports of values past two years—1897-98—was 990,389,183 gallons, valued at $55,804,297. Total value of exports, 1864 to 1898, inclusive, $1,445,941,156.

"The combined wealth of the railroads and trusts are jointly owned and used by railway and trust officials to absolutely control the internal commerce of this great nation and absorb unto themselves for their private gain the immense profits to arise from off all producing interests and manufactured products by higher rates of freight through unlawful rebates or freight discriminations, to be increased as they see fit, through compulsory railway tariff exactions, underhand secret tribute and demands, that must absolutely be complied with if shipments are made."

There will be several exhibits in connection with that which I have just presented.

Witness includes exhibits as follows:

"STANDARD OIL TRUST OFFICIALS PRESIDENTS AND DIRECTORS IN ONE-FIFTH TOTAL RAILWAY MILEAGE OF THE UNITED STATES.

"I shall be able to fully prove to this commission a living and prominent example thereof, as embodied in the Standard Oil trust, which has thus achieved its great wealth and power by dishonest and criminal methods in the unlawful use of our public highways, and through this means have become the largest owners in railway bonds and stocks; and today its officials are presidents and directors in one-fifth of the total railway mileage of the United States, all accomplished since 1872. This state of affairs is absolutely startling to contemplate—appalling, indeed, and as monstrous as it is infamous. This could not have been done except through one source, the railroads, whose officials have criminally conspired with Standard Oil officials for the past 27 years to give them their great power and unlawful, ill-gotten wealth.

"In 1887 the interstate commerce act was passed to stop these criminal conspiracies, but with 12 years' trial it has proved absolutely abortive.

"RAILWAY FREIGHT DISCRIMINATION IS THE FATHER AND BREEDER OF TRUSTS.

"I understand Mr. Havemeyer says that 'the tariff is the mother of trusts,' while I assert that railway freight discriminations is the father of them, the breeder of trusts, from which the greatest commercial evil of the present day arises. Although the tariff has its material effect, it is in no wise commensurate with the frightful freight discriminations; prominent example, the Standard Oil trust.

"Under the tariff it is not questioned but that every one pays the same duty, which is not the case in the payment of railway freights, for all competitors of the trusts must pay the enforced full tariff rates, jointly made by trust and rail officials, while trust freights are carried for nothing, one-fourth and one-half of the regular established rates, as is easily proved in the case of the Standard Oil trust. There is no question in my mind but all recent formation of trusts and combinations, and in which Standard officials are largely interested, are based upon and permeated with the same general plans, and investors therein privately advised that necessarily great advantages will accrue and larger dividends be declared on watered stocks through freight discriminations in the concentration of freight.

"The Standard Oil trust was the first industrial trust organized in this country, the originator and father of them all, from which all the rest have been bred. It is directly responsible for the formation of many subsequent trusts, because at an early date it lent its aid and support to the organization of other trusts, receiving therefrom large sums of money, to the extent of $250,000 from some of them (Cotton Seed Oil trust) for a copy of the secret unlawful trust agreement, decided illegal by two states (Ohio and New York), consequently all subsequent acts and resolu-

tions changing into corporate form, etc., are regarded illegal.

"MAGNITUDE OF THE STANDARD OIL TRUST.

"The magnitude of the Standard Oil monopoly, as consummated and centered in the Standard Oil trust, will be seen from the last enforced public utterance, in February, 1898, in which they really do admit having at least 20 corporations in the trust, capitalized at $102,233,700, of which pipe line companies represent over one-half—$52,455,200. In 1888 they reported 39 corporations in the trust, capitalized at $47,830,200, or less than one-half of the combined 20, and $5,000,000 less than the present capitalization of the pipe line companies.

"At the market price in May of 500, on par of 100, represents a valuation of over half a billion of dollars.

"SINCE THEIR PRETENCE OF DISSOLUTION, MARCH, 1892, THE STANDARD OIL TRUST HAS PAID OUT IN DIVIDENDS $170,730,279. . .

"For the first 10 years of the Standard Oil trust—1882 to 1892—it paid out in dividends more than double its entire capitalization in 1888. Since their pretense of a dissolution, March 21, 1892, and including September, 1899, they have paid 30 quarterly dividends of three per cent, or 90 per cent and paid 77 per cent in specials (none paid previous to December, 1895), or a total of 167 per cent, and on a capitalization of only $102,233,700 amounts to the sum of $170,730,279.

"There could have been paid much larger dividends if net earnings had not been and were not now being used in the purchase of large blocks of producing properties, paid for out of surplus earnings to the extent of many millions of dollars. While this trust accumulated these immense dividends and extra surplus earnings, there is not an independent refinery in the country which can even pay a small dividend. No new refineries have been built for several years, owing to this monstrous condition of affairs, and no material additions made to the old ones. The independent refiner is simply struggling for an existence, in the hope that an overruling Providence may yet come to the rescue.

"The Standard Oil trust now owns nine-tenths of all the local gathering pipe lines in the oil producing regions, consequently purchases 90 per cent of all the crude oil produced, and thus absolutely makes the market price for this great product, dictating to the producer the price he shall take for his oil and to the consumer what he shall pay for the products thereof, and take whatever quality of oil they choose to give. This monopoly governs and controls production by its necessities, increasing the price when more oil is needed and reducing it when less oil is required, so that greater percentage of profits may accrue with less capital used between the lowest priced crude possible and the highest price for the refined and not materially restrict consumption.

"The Standard Oil Trust dictates to the railway lines the compulsory tariff rates on petroleum its competitors must pay, while its own is carried at nominal figures, as was fully proven in my own experience when in business.

1872.—ATTACK BY THE TRUNK LINES OF RAILWAY ON THE PETROLEUM INDUSTRY, BY WHICH THE STANDARD OIL MONOPOLY WAS CREATED, AND WHICH CAUSED THE FORMATION OF THE STANDARD OIL TRUST, UNDER AND BY VIRTUE OF SEVERAL CONTRACTS MADE BY THESE ROADS WITH THE SOUTH IMPROVEMENT COMPANY, WHICH GAVE THEM THE MONOPOLY OF THIS GREAT INDUSTRY THROUGH RAILROAD REBATES OR FREIGHT DISCRIMINATIONS, COMPLETE CONTRACT.

"The origin of the Standard Oil trust was the Standard Oil Company of Ohio, which was organized January 10, 1870, with a capitalization of $1,000,000, increased to $3,500,000 March 13, 1875, at which it now stands. January 2, 1872, was the advent of the Standard Oil monopoly, by the directors of the Standard Oil Company of Ohio organizing a fictitious corporation called the South Improvement Company, with a nominal capital of $200,000, whose sole aim and object was to make secret rebate contracts with the railroads, as subsequently will be shown, and was exposed in 1879 by the Hepburn investigating committee, of New York; and fortunate it was that these contracts happen to be in writing and are now upon the records to condemn the makers of them from time to eternity. The Standard Oil Company received the grossest discrimination in the form of rebates, not only upon its own shipments, but also a like amount on the shipments of its competitors. These rebates ranged from 40 cents to $1.06 per barrel on crude petroleum and from 50 cents to $1.32 per barrel on refined.

"JANUARY 1, 1872, THE STANDARD OIL COMPANY ONLY HAD FIVE PER CENT OF THE PETROLEUM INDUSTRY AND ITS COMPETITORS HAD 95 PER CENT, WHILE IN 1879 THIS WAS REVERSED.

"At this early date in the oil business its competitors had 95 per cent of the petroleum industry, while the Standard Oil Company had less than five per cent, so that the Standard Oil Company received 19 times more rebates per barrel from off the shipments of its competitors than it did from off its own shipments.

"Henry M. Flagler, secretary of the Standard Oil trust, testified in April, 1888, before a congressional committee (page 288) that in 1870-71, just prior to the making of these unlawful rebate contracts—January 18, 1872—the refining capacity of the Standard Oil Company was 600 barrels a day. The average annual production of petroleum in the years 1870-71, per government report, was 5,232,989 barrels, or an average of 14,336 barrels a day, showing conclusively by the testimony of one of the highest of Standard officials that the Standard Oil Company had control of less than five per cent of this great industry just previous to the signing of these nefarious contracts.

"HENRY M. FLAGLER, SECRETARY OF THE STANDARD OIL TRUST, TESTIFIES THAT WILLIAM G. WARDEN, AN ORIGINAL TRUSTEE OF THE STANDARD OIL TRUST, AND THE LOGANS 'WERE THE GREAT LEADERS IN THE SOUTH IMPROVEMENT POLICY.'

"Mr. Flagler further testifies (pages 289, 290) that William G. Warden and the Logans, who were directors with him in the South Improvement Company, 'were the great leaders in the South Improvement policy,' and in the next breath denies it by saying that Payne and himself, 'or any one connected with the Standard Oil Company, had any confidence in or regard for the scheme known as the South Improvement Company,' and that 'the company never did a dollar's worth of business and never had any existence other than its corporate existence,' while William G. Warden, its secretary, testifies, on March 30, 1872, before a congressional committee, that its purpose was to refine oil and get 'all the refineries in the country into the company,' also gives the names of its 13 directors, as follows:

" 'Q. Where did that company intend to refine oil? A. Their calculations were to get all the refineries in the country into one company.

" 'Q. Was it the design of the stockholders to include all the oil refineries in this country? A. Yes, sir; every one of them.

" 'Q. Can you give us a list of the stockholders in the South Improvement Company? A. I can give them to you from the minutes. They are as follows:

	Shares.
John D. Rockefeller	180
William Rockefeller	180
H. M. Flagler	180
J. A. Bostwick	180
W. G. Warden	475
O. H. Payne (treasurer)	180
"Above were original trustees of the Standard Oil trust (1882).	
P. H. Watson	100
O. F. Waring	475
Richard S. Waring	10
Charles Lockhart	10
William Frew	10
John P. Logan	10
W. P. Logan	10
Original issue (par value, $100)	2,000

"The original trustees of the trust, as above shown, held 1,375 of the 2,000 shares, or 70 per cent of its capitalization, while the balance of the shares were held by the officials of the Standard Oil Company.

"This proves absolutely and conclusively that ostensibly the South Improvement Company was to control all the refineries in the country, but in reality its only official purpose was to make rebate contracts with the railroads.

"THESE GROSS REBATE CONTRACTS WERE APPROVED BY THE BOARD OF DIRECTORS OF THE SOUTH IMPROVEMENT COMPANY, COMPOSED WHOLLY OF THE OFFICIALS OF THE STANDARD OIL COMPANY.

"Peter H. Watson, its president, testified on April 5, 1872, before a congressional committee as follows (page 67, Rise and Fall of the South Improvement Company):

" 'Q. Was there any ratification by the company of your contracts with the railroad companies in its formal capacity? A. Yes, sir. They were approved by the board of directors, as appears in the minutes, and as I am informed, it having been done in a meeting at which I was not present.'

"This conclusively establishes the fact by the testimony of the president of the company that the above 13 directors of the South Improvement Company approved of these iniquitous contracts by a resolution of its own board of directors, as against the oft repeated denials of some of these men that they were not in said company or had anything to do with these unpalatable and unsavory contracts; but this clear and indisputable evidence places the responsibility of the inauguration of this villainous and most infamous scheme where it properly belongs—with Standard Oil officials.

"John D. Rockefeller, president of the Standard Oil trust, on February 27, 1888, testified before a legislative committee of New York state, relative to trusts (page 419) that he was not in it, but Warden above and Flagler below say that he was.

" 'Had there been, previous to that, a trust company called the South Improvement Company? A. No, sir.

" 'Q. There was such a company? A. I have heard of such a company.

" 'Q. Were you not in it? A. I was not.

"H. M. Flagler, secretary of Standard Oil trust, two months later, April 27, 1888, testifies before the manufacturers' committee of congress (p. 289):

" 'Q. Do you remember what was called the South Improvement Company? A. Yes, sir.

" 'Q. We have had in evidence here some facts relating to it. Who composed that company? A. I can not recall the names of all the gentlemen who were supposed to be interested in it.

" 'Q. Tell us to the best of your knowledge. A. The South Improvement Company was a matter brought to Mr. Rockefeller's and my attention perhaps six months before it was known publicly. Perhaps I shall ramble if I undertake to tell you all about it.

" 'Q. Precisely what I want to know is the names of all whom you knew to be connected with it A. William G. Warden, Charles Lockhart, William P. Logan, John Logan, J. D. Rockefeller, William Rockefeller, O. H. Payne and myself are the only names I recall.'

"Mr. Scheide, a former prominent official of the Standard Oil monopoly, testified before the Hepburn committee (p. 2766) as follows:

"'Q. Was the Standard Oil Company and the South Improvement Company the same at that time? A. The Standard Oil Company was part of the South Improvement Company.

"'Q. The South Improvement Company at that time was the larger, comprehending the Standard Oil Company? A. Yes, sir; it comprehended the Standard Oil Company and a dozen other different firms in Pittsburg and Cleveland.'

"These most extraordinary contracts were the sole cause of the creation of the Standard Oil monopoly, and the subsequent formation of the Standard Oil trust, and the inauguration of subsequent trusts.

"These contracts were signed by the trunk lines of road and Peter H. Watson, representing the Standard Oil Company, within 16 days after the organization of the South Improvement Company.

"It is a significant fact to note that Peter H. Watson, who signed these contracts on behalf of the Standard Oil Company, Janury 18, 1872, a few months later, July 9, 1872, was elected to the office of president of the Erie Railway Company, one of the trunk lines of this combine, and continued in office for the period of two years, until July 14, 1874.

"It is also a further most significant fact to note, that at the time these contracts were signed by the officers of these trunk lines of railway, they were cognizant of the fact that they were dealing with a mythical organization, which did not even own a refinery, nor was it in possession of a single oil well.

'It is difficult to conceive of a more malicious scheme to throttle competition, under the forms of law, and if permitted to continue, sooner or later sounds the knell of liberty.

"BRIEF EXTRACTS FROM THE FREIGHT CONTRACTS.

"'To pay and allow to the party hereto of the first part, on all petroleum and its products, transportation for it over the railroads of the party of the second part and its connections, the following rebates, and on all transported for other parties, drawbacks of like amounts as the rebates from the gross receipts, the same to be deducted and retained by the party hereto of the First part (Standard Oil Company), for its own use, from the amounts of freights, payable to the party of the second part.'

"'And it is hereby further covenanted and agreed by and between the parties hereto that the party hereto of the second part (Pennsylvania Railroad Company) shall at all times co-operate, as far as it legally may, with the party hereto of the first part (Standard Oil Company) to maintain the business of the party hereto of the first party against loss or injury by competition, to the end that the party hereto of the first part may keep up a remunerative, and so a full and regular business, and to that end shall lower or raise the gross rates of transportation over its railroads, as far as it legally may, for such times and to such extent as may be necessary to overcome such competition. The rebates and drawbacks to the party of the first part to be varied *pari passu* with the gross rates.'

"'The party hereto of the first part (South Improvement Company) from time to time shall notify the party of the second part, in writing, of the change required, whereupon the party hereto of the second part (Pennsylvania Railroad Company) shall forthwith make a corresponding change of such gross rates.'

"'It is further mutually agreed by and between the parties hereto that this agreement shall continue and remain in force for the period of not less than five years; and shall not then nor thereafter terminate until one of the parties shall have given 12 months' written notice to terminate it.'

"'South Improvement Company, party of the first part, by Peter H. Watson, president (president of the Erie Railway Company 1872 to 1874).

"'Parties of the second part:

"'Pennsylvania Railroad Company, J. Edgar Thomson, president, and for the Pennsylvania Company, Philadelphia and Erie Railway Company, Northern Central Railway, Allegheny Valley Railroad, Camden and Amboy Railway.

"'The New York Central and Hudson River Railroad Company, William H. Vanderbilt, vice president, and for the Lake Shore and Michigan Southern Railway.

"'Erie Railway Company, Jay Gould, president, and for the Atlantic and Great Western Railroad Company.'

"(Original contract, pamphlet B, p. 7, George Rice.)

"Frank Rockefeller, brother of John D. Rockefeller, on July 7, 1876, testified before a congressional committee against his brother (per following extracts), and fully confirmed the results of the disastrous effects of the above contracts by saying that John D. Rockefeller and Henry M. Flagler told him, 'If you don't sell your property to us it will be valueless, because we have got advantages with the railroads (tactics of Jack Sheppard, Claude Duval):

"'Q. Do you know how many refineries there were in Pittsburg prior to this alleged combination? A. I have been told there were 60 and odd refineries.

"'Q. How many are there now? A. I was told by the same parties that there were now less than 20 and very few doing business.

"'Q. (By Mr. Regan.) What is the cause of that reduction in the number of refiners? A. I suppose the main cause has been the fact that they could not make money. I have understood that the same lever was brought to bear upon them as upon the Cleveland refiners. We had in Cleveland at one time about 30 establishments, but the South Improvement was formed and the Cleveland companies were told that if they didn't sell their property to them it would be valueless; that there was a combination of railroad and oil men; that they would buy all they could, and that all they didn't buy would be totally valueless, because they would be unable to compete with the South Improvement Company, and the result was that out of the 30 there were only four or five that didn't sell.

"'Q. From whom was that information received? A. From the officers of the Standard Oil Company. They made no bones about it at all. They said: "If you don't sell your property to us it will be valueless, because we have got advantages with the railroads."

"'Q. Give the names? A. J. D. Rockefeller, H. M. Flagler and O. H. Payne.

"'Q. (By Mr. Ross.) Mr. Payne is the son of the member of congress of that name? A. Yes, sir.

"'Have you heard those gentlemen say what you have stated? A. I have heard Rockefeller and Flagler say so. Other parties have told me that Payne has used the same argument with them.

"'Q. What other parties? I won't give you the names now. There are some 20 men in Cleveland who sold out under the fright, and almost any of them will tell you that story.

"'Q. Give us the names of some of those that sold out? A. J. W. Faucett, of Cleveland; W. C. Scofield, Joseph Stanley, John Chritchely. Those are some of them.'

"I also refer to the testimony of John Alexander, W. H. Doane, Charles I. Morehouse and Isaac L. Hewitt, who sold out one-third to one-half of the cost of their refineries (B. 18-19).

"FREIGHT RATES DOUBLED WITHIN 30 DAYS AFTER SIGNING OF THESE CONTRACTS IN ORDER THAT THE REBATES MIGHT NOT BE SO DISPROPORTIONATE TO THE TARIFF CONTRACT RATE.

"On February 26, 1872, 30 days after these iniquitous contracts were made, freight rates on petroleum were doubled, and on oil only (South Improvement pamphlet, p. 5) by which these most extraordinary of rebates would not seem so disproportionate to the tariff rates.

"In this connection it might be well to state that the charter of the South Improvement Company was repealed by the legislature of Pennsylvania under the intense excitement and universal indignation aroused against it throughout the oil region from producers, refiners and shippers of oil.

"On March 25, 1872, the same lines of railway, under threats of destruction of their properties, entered into an agreement with the independent refiners and producers of oil to give them equal rates and facilities as enjoyed by the Standard Oil Company, as follows:

"'That all arrangements for the transportation of oil after this date shall be upon a basis of perfect equality to all shippers, producers and refiners, and that no rebates, drawbacks or other arrangements of any character shall be made or allowed that will give any party the slightest difference in rates or discrimination of any characted whatever. * * * *

"'And said rates shall not be liable to any change, either for increase or decrease, without first giving to William Hasson, president of the producers' union at Oil City, at least 90 days' notice in writing of such contemplated change.

"'In the distribution of cars for shipments it shall be done without discrimination.

"'On the basis as hereinbefore stated, the parties respectively agree to carry out the arrangements in good faith and work for the mutual interest of each other.

"'In witness whereof the parties have hereunto affixed their signatures, this 25th day of March, A. D. 1872.

"'For the Lake Shore and Michigan Southern Railroad Company, H. F. Clark, president.

"'For the Erie Railroad Company, O. H. P. Archer, vice president.

"'For the New York Central and Hudson River Railroad Company, Wm. H. Vanderbilt, vice president.

"'For the Atlantic and Great Western Railroad Company, George B. McClellan, president.

"'For the Pennsylvania Railroad Company, Thomas A. Scott, vice president.'

"It is important to note the fact that the above 90-day notice was never given in order that competitive shippers would understand that said agreement was honestly kept in full force and effect.

"Simon Sterne, counsel for the Hepburn committee, says that 'after the South Improvement Company was broken up these same terms and rebates were, without any open contract, substantially continued to the Standard Oil people.'

"George R. Blanchard, second vice president of the Erie Railway Company, on October 17, 1879, testified before the Hepburn committee 'that this agreement, although fully considered and agreed upon, lasted less than two weeks.' So that necessarily the same contract transportation rates and rebates continued indefinitely.

"TRUSTEES OF THE STANDARD OIL TRUST TESTIFY IN 1879 THAT THEY CONTROL 95 PER CENT OF THE OIL INDUSTRY, WHERE SEVEN YEARS PREVIOUSLY THEY ONLY CONTROLLED FIVE PER CENT.

"In October, 1879, Henry H. Rogers, present trustee (p. 2615), and J. A. Bostwick, a former trustee (p. 2696), testified before the Hepburn committee of New York that the Standard Oil Company at this early date controlled 95 per cent of the entire oil industry of the United States, when just previous to the making of these rebate contracts the Standard Oil Company only had 5 per cent of it, having acquired by unlawful and dishonest means, within the brief space of seven years 90 per cent more of this great industry, transforming and completely changing ownership from the hands of the many into the hands of a minor few, wholly through the connivance and conspiracy combination and acts of Standard and railroad officials.

"Moreover, while the Standard was thus building up its monopoly the railroads were at the same time destroying the value of their own properties, and the non-payment of dividends and appointment of receivers in many instances were due to these unwise, illogical, and dishonest practices.

"The effect of these contracts was to carry the Standard oil free and pay it a large bonus besides. Railroad freights were doubled that greater rebates might follow, while the consumer of petroleum became the victim, and was forced to pay, indirectly, untold millions of rebates in higher-priced oil and of a poorer quality through railway tariff exactions for the sole benefit of a few unscrupulous rail and trust officials jointly interested.

"Frank Rockefeller also testifies, July 7, 1876,

that such prominent railroad men as William H. Vanderbilt, Amasa Stone, Devereaux, and John Newell, were stockholders in the Standard Oil Company.

"'You spoke a while ago of having a personal knowledge of certain railroad officials having been stockholders in the Standard Oil Company—how do you know that? A. I know it from the officers of the Standard Oil Company telling that they were stockholders.

"'Who are they? A. William H. Vanderbilt, the vice president of the New York Central Company, was at one time a stockholder in the Standard Oil Company; also Amasa Stone, of Cleveland, the general manager of the Lake Shore road, and I have very good reason for believing, though I do not know it, that Mr. Devereaux and Mr. Newell are both stockholders at the present time. Mr. Stone sold his stock some two years ago, at or before the time when he quit the railroad. He put his stock on the Cleveland market and sold it, and he is not, I believe, a stockholder today.'

"And says he thinks that William H. Vanderbilt, Tom Scott, Devereaux, Newell, and other officials of the railroads received rebates.

"'Q. (By the Chairman.) Give us the names of the officials of the railroads that you think received the benefit of this rebate. A. Understand me. I don't say they did get it. It is merely my opinion.

"'Q. Give me the names of the gentlemen that you think do reap the benefit of that rebate. A. I think that Mr. Devereaux gets it, and that Mr. Newell gets it, that Tom Scott gets it, and that Mr. Vanderbilt gets it, and other officers of those roads whose names are not in my mind at present.

"Also further testifies that rebates go into a pool and are divided up between the Standard Oil Company and railroad officials.

"'Q. What do you mean by the pool—a pool among the railroads or among the oil men? A. I don't give this as a positive fact, but, as I understand the arrangement, the New York Central, the Erie, the Atlantic and Great Western, the Pennsylvania Railroad, the Cleveland, Columbus and Cincinnati, and the Baltimore and Ohio roads have a pool—are combined for the purpose of shipping oil, and oil only—and in this pool the Baltimore and Ohio gets a certain number of barrels to go over its road, the Lake Shore so many to go over its road, and the Pennsylvania Company so many to go over its road from different points in the country, and on the oil that is shipped over these roads by the pool and the Standard Oil Company there is a rebate or a drawback from the shipment of so much, which is put into this pool, over whichever road the oil may go, and that rebate is divided up between the Standard Oil Company and the railroad officials.

"'Q. The railroad officials, do you say? A. So I understand it. I don't say that of my own knowledge.

"'Q. Then it does not go to the railroads themselves? A. No, sir.

"'Q. But to the railroad officials? A. To the railroad officials.

"It will be quite interesting to figure out in dollars and cents the amount of rebate money per barrel the Standard Oil Company received off the shipments of its competitors under these ironclad rebate contracts, it being made the medium to pay over into a trust pool the following gross competitive rebates, which were to be divided between rail and trust officials:

"REBATES OF $7.60 TO $20 PER BARREL TO RAIL AND TRUST OFFICIALS ON COMPETITIVE SHIPMENTS OF CRUDE OIL. THE AVERAGE MARKET PRICE OF CRUDE OIL FOR THIS YEAR WAS $3.64 PER BARREL.

"On shipments of crude petroleum from any common point, Oil City, Union, Corry, Irvineton, so designated by the contracts, the open public tariff rates from said point to Cleveland and Pittsburg, where Standard Oil refineries are located, was 80 cents a barrel, while the underhand, secret rebate was 40 cents a barrel, so that the Standard Oil Company not only received 40 cents a barrel rebate on each barrel it shipped for its own direct use, while it additionally received from off the shipments of its competitors a share in 19 times the amount, or $7.60 per barrel, as against each barrel it shipped, which went into the rebate trust pool, as previously testified to by Frank Rockefeller.

"From said points to Baltimore and Philadelphia the open tariff rate on crude petroleum was $2.41, to New York $2.56, and to Boston $2.71 per barrel, while the rebate to each point was $1.06 a barrel, so that the Standard Oil Company not only received $1.06 a barrel rebate on each barrel shipped for its own use, but additionally received from off the shipments of its competitors a share in 19 times this amount, or $20.14 per barrel, as against each and every barrel it shipped, which was also dumped into the rebate trust pool.

"REBATES OF $9.50 TO $25 PER BARREL TO RAIL AND TRUST OFFICIALS ON COMPETITIVE SHIPMENTS OF REFINED OIL.

"On refined oil, benzine, and other products of the manufacture of petroleum these secret rebates were greater, as the following will show:

"The open, public tariff rate under these contracts from Cleveland and Pittsburg to Baltimore and Philadelphia was $1.85 per barrel; to New York, $2. From Cleveland to Boston (Pittsburg left out), $2.15 per barrel, while the rebates from and to all these points was 50 cents a barrel, so that the Standard Oil Company not only received 50 cents a barrel rebate on each barrel shipped for its own use, but additionally received from off the shipments of its competitors a share in 19 times this amount, $9.50 per barrel rebate, as against each barrel it shipped, which also went into the rebate trust pool.

"The tariff under these contracts from designated common points, such as Oil City, Union, Corry, Irvineton, where competitive refineries were located,

was 92 cents per barrel more with less hauls to all seaboard points, as follows:

"To Baltimore and Philadelphia, $2.77: New York, $2.92; Boston, $3.07 per barrel, while the rebates from and to all these points were $1.32 per barrel, so that the Standard Oil Company not only received $1.32 per barrel on each barrel it shipped for its own direct use, but in addition thereto it received from off the shipments of its competitors a share in 19 times this amount, or $25.08 per barrel, as against each and every barrel it shipped, which was also put into this rebate pool to be divided between rail and trust officials. The average market price per barrel of crude petroleum in 1872 was $3.64, or 8.66 cents per gallon, while the average market price of refined oil for export in the same year was 24.9 cents per gallon, or $12.45 per barrel, and this is how the Standard Oil monopoly has made oil so cheap to the consumer.

"These most extraordinary revelations seem incredible and beyond belief, but they are the facts as revealed by these contracts, and are plainly the sole cause of the creation of the Standard Oil monopoly, the Standard Oil Trust, and the formation of the present epidemic of trusts.

"Hon. Franklin B. Gowen, former president of the Philadelphia and Reading Railroad Company, had this to say before the Interstate Commerce Commission January 17, 1888:

"'I remember well, in those halcyon days when Fisk and Gould controlled the Erie Railway and managed the Atlantic and Great Western Railroad, that an oil association made a contract with the railroad company which gave them a rate on oil, based upon the price at tidewater, with a guaranty that a fixed rate per barrel profit should be made in handling it. The first year's business over the Atlantic and Western Railroad developed the fact that the hundreds of thousands of barrels transported under this contract brought not one cent into the treasury of the railroad for transportation, and that the railroad company had to pay, at the end of the year, 25 cents upon every barrel for the privilege of transporting it in order to make up the guaranty of a fixed profit to the dealer.'

"TO TAKE EFFECT OCTOBER 1, 1874.—PLAN BY WHICH A COMBINATION OF RAILWAYS FORCE THE INDEPENDENT PIPE LINES OF THE OIL REGIONS TO SELL OUT TO THE STANDARD OIL MONOPOLY AT THE PRICE OF OLD JUNK, AND ALSO GAVE THEM ADDITIONAL DISCRIMINATIONS IN THE SHIPMENTS OF REFINED OIL, IN GROSS VIOLATION OF THE AGREEMENT OF MARCH 25, 1872.

"'After the wholesale destruction of competitive oil refineries by the railroad rebate contracts of 1872, which absolutely gave the Standard Oil Company the monopoly in the manufacture of petroleum and of its rail transportation, achieved so easily and with such success, that two years later (1874) it eagerly sought and again applied to the railroads for help to secure the control and monopoly of the local pipe line transportation of petroleum in the oil producing regions, which was easily accomplished by their mutual and trusted friend, J. H. Rutter, general freight agent of the New York Central and Hudson River Railroad Company. He issued a circular, to take effect October 1, 1874, as follows:

"'From which shall be refunded 22 cents a barrel only on oil coming from pipes which maintain the agreed rates of pipage.

"The agreed rates of pipage could not, of course, be maintained by the independent pipe lines, which had to lower transportation rates in order to offset the exclusive 22-cent rebate advantage given to the Standard Oil Company, by which they were enabled to bid 22 cents a barrel more for crude oil and not lose anything. The resulting effects were that the old, established pipe lines had to succumb. They could not make money and were forced to sell out their properties at the price of old junk to those joint-interested railroad and Standard Oil conspirators.

"E. G. Paterson, before the Hepburn committee, August 28, 1879, testified as follows:

"'A. The effect of it was that whoever was dealing through a pipe line which was receiving that 22-cent drawback from a railroad company, absorbed or crushed out the business of any opposition pipe line, by putting its buyers into the field and bidding the whole or a portion of that drawback, more for the product than those who were buying through another pipe line could, not receiving such a drawback.'

"Simon Sterne, in his argument before the Hepburn committee, said as follows:

"After the Rutter circular appeared the independent pipe lines died off like sheep and were all bought up by the Standard Oil Company.'

"As early as 1874 the Standard Oil Company was in possession of all tank cars and the terminal facilities of the railroads at the seaboard. (George Rice book, pp. 38, 39, 40.)

"Franklin B. Gowen's argument (page 13) before the Manufacturers' committee of Congress (1889) has this to say:

"'At this time the American Transfer Company, according to the testimony of its owner, Mr. J. A. Bostwick (p. 386), was a corporation having from 50 to 75 miles of local pipage, a capital of $100,000, and no debt. And yet upon this small capital it received from the three trunk lines in 1878 the magnificent income of $3,093,750, or 22½ cents upon the 13,750,000 barrels of oil shipped in that year, equal to a dividend of 3,093 per cent annually.

"1877-1878.—ATTACK BY THE RAIL LINES UPON THE EMPIRE TRANSPORTATION COMPANY, BY WHICH ITS REFINERIES PIPE LINES, 1,000 TANK CARS, AND 400 RACK CARS WERE FORCED INTO THE HANDS OF THE STANDARD OIL COMPANY AT A RUINOUS PRICE. FREIGHT RATES CUT TO EIGHT CENTS PER BARREL LESS THAN NOTHING DURING THE FIGHT, AND WHEN ENDED, COMPETITORS OF THE STANDARD OIL COMPANY WERE CHARGED $1.90 PER BARREL, WHILE THE STANDARD OIL WAS CARRIED AT ELEVEN CENTS PER BARREL, NET, IN TANK CARS, LUMP SUM, REGARDLESS OF WEIGHT—1,600 PER CENT DISCRIMINATION.

"The transportation tariff rates on refined oil to competitive refineries in 1878 was $1.90 per barrel to the seaboard. The Standard Oil Company, through its well-trained railroad agent, J. H. Rutter, general freight agent of the New York Central and Hudson River Railroad Company, gave it a special freight rate on petroleum, Cleveland to New York, of $60 per tank car, a lump sum, regardless of weight, or 60 cents a barrel, average rate, from which there was deducted the transportation charge on crude oil from the wells to Cleveland and Pittsburg on the basis of 14 barrels of crude, at 35 cents a barrel, or $4.90, as against 10 barrels of refined from Cleveland and Pittsburg to New York, at 60 cents a barrel, or $6, leaving $1.10 net, or only 11 cents a barrel paid by the Standard Oil Company, as against $1.90 per barrel their competitors had to pay, or 1,600 per cent freight discrimination allowed them by the conspiracy acts of rail officials.

"1879.—ATTACK BY THE RAIL LINES UPON THE TIDE-WATER PIPE COMPANY TO CRUSH AND DESTROY IT IN THE INTEREST OF THE STANDARD OIL COMPANY—THE TRUNK LINES OF RAILWAY AGAINST THE PHILADELPHIA AND READING RAILROAD COMPANY, BY WHICH RAIL RATES WERE REDUCED TO ONE-SIXTH OF A CENT PER TON PER MILE AND BARELY YIELDED THE COST OF THE FUEL FOR THE ENGINES.

"The fight against the Tide-Water Pipe Company would have succeeded but for the prompt financial support given by the Philadelphia and Reading Railroad Company, of which Hon. Franklin B. Gowen was president.

"The Tide-Water Pipe Company, first projected seaboard pipe line, had contracted to get its oils to tide water by another and cheaper route to avoid the excessive discriminating freight rates constantly being imposed by the trunk lines of railway in the interest of the Standard Oil Company.

"The Tide-Water Pipe Company laid a 6-inch line of pipe, 110 miles in length, from the Bradford oil regions to Williamsport (a station on the Reading road), and, by joint traffic arrangement between the Philadelphia and Reading and the Central Railroad Company of New Jersey, had secured rates to the seaboard which were to be equal to the rates paid by the Standard Oil Company over the trunk line of railway, and on account of the fight freight rates were cut to 15 cents a barrel in favor of the Standard Oil Company, which barely yielded the cost of the fuel for the engines.

"EXTRACT FROM ANNUAL REPORT OF FRANKLIN B. GOWEN, PRESIDENT OF THE PHILADELPHIA AND READING RAILROAD COMPANY, TO THE STOCKHOLDERS.

"'Within the last two or three years certain producers and shippers of oil, in order to reach the few refineries in the neighborhood of New York which yet remained independent of the Standard Oil Company, associated themselves as the Equitable Pipe Line Company, laid a local pipe to connect with a railway terminating at Buffalo, and shipped from the latter place crude petroleum in canal barges, via the Erie Canal, to the waters of New York bay.

"'As this avenue of transportation was closed during the winter, it proved ineffectual as a source of permanent supply, and in order to secure an outlet for the entire year, as well to Philadelphia as to New York, certain gentlemen interested in the Equitable Pipe Line Company, Limited, and, having secured the right of way, laid a 6-inch pipe line a distance of over 100 miles, from the Bradford oil region, in McKean county, Pa., to Williamsport, the terminus of the Catawissa branch of this company, and a contract was entered into between the Tide-Water Pipe Line Company, this company, and the Central Railroad Company of New Jersey for the transportation of the oil to Philadelphia and New York by rail from Williamsport.

"'This attempt of the producers of oil to secure an outlet independent of the Standard Oil Company and the trunk lines was at once resented by both interests affected, and from the date of the completion of the pipe line to the present, every effort has been made by some of the companies interested to convert the profitable business of the transportation of the oil into a losing one.

"'The trunk line rates on oil by rail have been so reduced as to yield at times but about one-sixth of a cent per mile for its transportation, or about one-quarter of the actual cash cost, and for many months motive power which might have been most profitably employed in hauling remunerative traffic has been occupied with an enormous tonnage of oil which barely yielded the cost of the fuel for the engines.'

"I also refer this commission to the report of the Hepburn committee of New York, January 22, 1880, investigating the Standard Oil monopoly, in which those astounding and celebrated rebate contracts of 1872 were exposed. The following are extracts of the report:

"'In which these roads agreed to pay said company rebates on shipments to different points, ranging from 40 cents to $3.07 per barrel.'

"'The roads transporting the refined oil shall refund to the refiners, as a drawback, the charges paid by them upon the crude oil reaching their re-

fineries by rail; and the roads transporting through crude oil to the eastern seaboard shall refund to the shippers 22 cents per barrel; both of said drawbacks to be paid only on oil reaching the initial points of rail shipment through pipes, the owners of which maintain agreed rates of pipage." By this agreement the roads carry crude oil from the oil regions to Cleveland and Pittsburg and then carry the refined oil to the seaboard as cheaply as they would from the mouth of the well. Mr. Vanderbilt explains this (Testimony, p. 1596).'

"'In June, 1879, the Tide-Water Pipe Line effected a connection with the seaboard and commenced shipping oil. Opposition, of course, was not to be brooked, and again the Standard called upon the railroads to protect them "against injury by competition," and again the railroads responded. On June 5, at a conference between the four trunk lines and the Standard people held at Niagara, the rate on crude oil was made to the Standard over the Erie and Central 20 cents per barrel (from $1.40). The rates to Philadelphia and Baltimore were made the same.

"The Standard got the 'plum;' and as a result it owns exclusively the terminal facilities for handling oil in Philadelphia and Baltimore.

"It owns and controls the terminal facilities for handling oil of the four trunk roads. It owns and controls the pipe lines of the producing regions that connect with the railroads. It controls both ends of these roads. It ships 95 per cent of all the oil.

"It dictates terms and rates to the railroads.

"They can use the power here given them, and have used it to crush out opposition.

"This company also owns all the oil cars run on the Central road.

"It has bought out and frozen out refiners all over the country.

"By means of superior facilities for transportation which it thus possessed it could overbid in the producing regions and undersell in the markets of the world.

"Resting under the commerce law obligation to treat all parties alike, they deliberately undertake to protect a certain company 'against injury by competition.'

"Thus it has gone on buying out and freezing out all opposition until it has absorbed and monopolized this great traffic, this great production, which ranks second on the list of exports of our country.

"And yet all the trunk lines have grown into such relations with this oil combination that they were forced to forgo all these millions they might have earned and look to the other produce of the country for their revenue.

"They bury their own interests in the interest of the Standard Oil Company and join in this war of rates to protect it 'against injury by competition,' whose business and transactions are of such a character that its members declined giving a history or description of it lest their testimony be used to convict them of a crime.

"JOSIAH LOMBARD, R. T. BUSH, GEORGE F. GREGORY, COMPETITIVE OIL REFINERS AT THE SEABOARD, TESTIFY IN 1879 WHAT A. J. CASSATT, NOW PRESIDENT OF THE PENNSYLVANIA RAILROAD COMPANY, AND TOM SCOTT, FORMER PRESIDENT, SAID TO THEM ABOUT THE STANDARD OIL COMPANY.

"Cassatt says to Lombard:

"'That the Standard Oil Company was the only party that could keep peace between the trunk lines.'

"'He said "I can not trust," or, rather, he said "They are the only people that can keep harmony."

"'I asked Mr. Cassatt if we shipped as much oil over the Pennsylvania Railroad as the Standard Oil Company whether we should have the same rate of freight. He said "No." I said "Why?" He said because they would not be satisfied.

"'We asked him whether the discrimination against us would be larger if the rate of freight were high than it would if the rate of freight were low. He said yes; it would be.'

"Also said:

"'That if we built a pipe line he would buy it up for old iron in 60 days.'

"'He said there would be no peace or profit in the business until we made some arrangements with the Standard Oil Company.'

"R. T. Bush to Mr. Cassatt:

"'That is, you asked Mr. Cassatt? A. Mr. Cassatt, whether we should have as low a rate of freight as the Standard Oil Company or any other shipper. He said "No." We asked him why. "Well, in the first place, you can't ship as much oil as the Standard Oil Company." "Well, if we could ship as much oil"—I think Mr. Lombard put this question—"would we then have the same rate?" He said "No." "Why?" "Why, you could not keep the road satisfied; it would make trouble; you would not keep the road satisfied; you could not satisfy the roads; you could not satisfy the different trunk lines;" and he remarked, in connection with that, that the Standard Oil Company was the only party that could keep the road harmonized or satisfied.'

"Well, you may lay all the pipe lines you like and we will buy them up for old iron.

"To Tom Scott:

"'Q. Go back again to the interview with Colonel Scott and tell us more particularly about it. A. They tried to make us believe and feel, I suppose, that we were getting our due proportion, when for some considerable time previous to this we had not been able to do any business in advance. We could only do business from hand to mouth. We could not sell any refined oil unless we absolutely had the crude oil in our possession in New York, and Mr. Lombard, one of our number, had sold a cargo of crude oil, I think, 9,000 barrels, and Denslow & Bush absolutely stopped their refinery for three weeks, consequently, in order to let their oil go to Lombard & Ayers to finish their vessel, because

they would only get three or four cars a day; and we stopped our place for three weeks to give them our crude oil, all we could give—our proportion—in order to lift them out and get their vessel cleared.

" 'Q. At the interwiew between Colonel Scott and Mr. Cassatt and yourself, here at Philadelphia, did you gentlemen propose to build your own cars or provide yourselves with cars? A. Yes, sir; we told Mr. Scott that if they hadn't sufficient cars on their road we would like to put some on, and he told us flatly that they had just bought out one line and they would not allow another to be put on; that if they hadn't cars enough they would build them.

" 'Whether we could have—if there was any means by which we could have the same rate of freight as other shippers got, and he said flatly, "No;"and we asked him then if we shipped the same amount of oil as the Standard, and he said "No," and gave the same reasons Mr. Cassatt had in New York.

" 'Q. Did he give you the information as to the rate of discrimination? A. No, sir. All the information we got on that point was from Mr. Cassatt, in New York, when he stated that the discrimination would be larger on a high rate of freight than on a low rate of freight, which led us to infer that it was a percentage discrimination. That is all the point that I recollect we ever got as to the amount of the commission.'

'George F. Gregory to Cassatt:

" 'We asked him if we should have as low a rate of freight—we spoke a good deal of what had been printed in the newspapers in regard to rates, etc., and we asked him if we should have a rate of freight as low as the Standard Oil Company, and he said "No."

" 'Mr. Lombard asked him if we could have the same rate of freight that the Standard had if we shipped the same amount of oil He said "No; you can not."

" 'Mr. Cassatt declined to state what the discrimination was. I said to him, "Is it a greater discrimination on a higher rate of freight than it is on a law rate," and he said "Yes." He said, "Well, I didn't mean to answer that question; but very well," he said, "I have answered it."

" 'Q. Please to state what you denominate the squeeze. A. A squeeze or a scarcity of cars; that is what we call it; a difficulty in getting cars in sufficient amount; that is what I mean.

" 'Q. That is, Green Line cars, you mean, from Mr. Brundred, as agent of the Pennsylvania Railroad? A. Yes, sir.'

"This ought to be sufficient to briefly summarize how the Standard Oil Company acquired its monopoly of the petroleum industry and still holds it with a bulldog grip, and by its actions considers all competitors as interlopers or outlaws. My pamphlets, here introduced, marked "A," "B" and "C," and Newlin's, marked "D," will more fully substantiate it. I also refer this committee to my testimony given in 1888 before a Congressional committee."

FAVORITISM IN BUYING LUBRICATING OILS.

Q. (By Mr. Jenks.) Have you a copy with you of this testimony before the Congressional committee? A. No, sir; I have not. You have that volume. Since I have put these in as exhibits I think I had better put these others in as exhibits now. I also present and submit to this commission Exhibit E, the authorized Official Railway Guide of the United States for September, 1899, which gives, on page 43 and subsequent pages, a list of the 44 unlawful freight associations and freight committees heretofore mentioned by me.

You will also perceive on the front page of said guide an advertisement of the "Galena Oil Company"—Standard Oil Trust—in which this trust advertises its goods as follows:

"Galena oils are used on nineteen-twentieths of the total railway mileage of the United States, Canada, and Mexico, and are being introduced in Europe."

That is to say, the Standard Oil Trust here admit that they furnish their lubricating oils to 95 per cent of all the railways in the United States, Canada and Mexico, and portions of Europe. That is to say, this trust furnished 95 per cent of all such oils as are used by the railways mentioned, for no railroad would use trust and competitive oils in conjunction. These oils are taken by the railroads at most extraordinary prices, ranging from 25 to 75 cents a gallon; and here come in another species of favored freight discriminations.

Q. (By Mr. Farquhar.) That seems quite a large claim in respect to the Standard Oil Company in the matter of Galena oils. What is the character of the Galena oils in the market among railroad men and among buyers? A. Well, I know from hearsay that they furnish different grades of lubricating petroleum, running from 25 cents up to cylinder stock—cylinder goods.

Q. Has it not been a fact that Galena oil has really held the American market for years as one of the best standard oils—best quality of oil? A. I do not know anything about the quality.

Q. Is it not a fact that the headlight oil is the best oil made in the world? A. I do not know it to be a fact.

Q. Is not its general use a good reason for thinking that it is so? A. Well, I suppose they would have to make a pretty good quality of oil to get good prices, but at the same time they get greater prices than any competitor could get, and a competitor could hardly get any chance. I know that on general hearsay. Parties have been told that they could not sell the railroads of the country lubricating oils because if they did the Standard Oil Company would not give them any freight.

Q. Do you know whether it is the fact or not that the Standard Oil Company paid exorbitant prices for the Galena formula, for the word? A. No; I do not know.

Q. Have you ever sold in competition with the Galena oil anywhere? A. No; I have sold some, but in a very moderate way. I never manufactured

any fancy brands of lubricants at all. I just manufactured ordinary oil—ordinary lubricant—a cheap grade.

Q. (By Mr. Jenks.) You spoke a moment ago about the high prices the Standard Oil Company received from the railroads for lubricating oil. Were you going to support that general statement by the specific prices? A. No; I can not support that by specific prices, excepting by talking with persons that knew about it who have tried to sell the railroads and have been told. It is only hearsay.

Q. (By Senator Kyle.) What are the figures that are paid for this kind of oil? A. From 25 cents up to 75 cents a gallon. There are some oils as high as $1 a gallon.

Q. (By Mr. Jenks.) Your information in reference to high prices is on authority of the Standard's competitors and not on authority of any of the Standard's officials or of railroad officials? A. No, sir; no, sir.

Mr. Jenks. Continue, please.

DESPEUX VS. PENNSYLVANIA RAILROAD COMPANY, DISCRIMINATIONS 1881 TO 1883.

The Witness. By permission of Mr. J. W. M. Newlin, of Philadelphia, who was the attorney for some French refineries, I put in this book, marked "D," under the title of Despeaux vs. Pennsylvania Railroad Company. It is a bill of exceptions in a suit for freight discrimination that occurred in 1882 and 1883; but the cases were tried last year, and Mr. William Rockefeller and several Standard Oil Company officials testified in Philadelphia. I did not expect that Mr. Newlin was going to give me the privilege of putting it in. In this exhibit there are several important contracts made with the Standard Oil Trust, including a special contract of August 22, 1884, made by the National Transit Company and the Pennsylvania Company, by which the Standard Oil Trust, through the National Transit Company, was to pay to the Pennsylvania Railroad Company 26 per cent of all the petroleum freights carried from the oil region to the seaboard at tariff rates. I have referred to this in my testimoney. I will now read a letter of the counsel covering the substance of the case.

Philadelphia, Pa., November 2, 1899.

Dear Mr. Rice: Referring to your request for information as to the facts developed in the taking of testimony in the cases of Fenaille & Despeaux vs. The Pennsylvania Railroad Company in the circuit court of the United States for the eastern district of Pennsylvania, and in the case of Ladenburg, Thalmann & Co. vs. The Pennsylvania Railroad Company in the court of common pleas, No. 4, of Philadelphia county (both of which cases are still pending), I beg to say as follows:

In the Fenaille & Despeaux case it was shown that the plaintiff paid local pipage 20 cents per barrel to Foxburg and other points in that region on crude oil, and that in addition thereto the plaintiff paid to the Pennsylvania Railroad Company 48 cents per barrel for its carriage, all rail, from Foxburg to Communipaw during the years 1881, 1882, and 1883. It was also shown that the Pennsylvania Railroad Company at the same time and between the same points carried crude oil for the Standard Oil Company of New York at a reduction of 22½ cents per barrel.

It was further shown in the same case that the plaintiff paid 20 cents local pipage on crude oil to McCalmont and other points in the same region, and that the Pennsylvania Railroad Company then carried it to Communipaw and charged the plaintiff 33 cents per barrel.

At the same time the Pennsylvania Railroad Company was carrying crude oil between the same points for the Standard Oil Company of New York as proven in this way:

On May 6, 1881, the National Transit Company made an agreement with the Pennsylvania Railroad Company concerning the shipments of crude oil to the seaboard under which these reductions in favor of the Standard Oil Company were effected. I have furnished you a copy of this agreement.

It was shown on the trial of the Fenaille & Despeaux case that at the time named a majority of the stock of the National Transit Company was deposited, with other corporation stock, with the Standard Oil trustees, who also held practically all of the stock of the Standard Oil Company of New York and that upon the basis of the stock holdings of the trust the Standard Oil trust certificates were issued.

The agreement between the National Transit Company provides for a division of the through rate on crude oil from the wells to seaboard between the National Transit Company and the Pennsylvania Railroad Company. The clause of the contract particularly referring to this are paragraphs 4 and 8 thereof.

Now, taking Foxburg to Communipaw, the local pipage being 20 cents and the all rail carriage 48 cents or 68 cents, and the evidence showing that the transit company under this agreement delivered large amounts of oil to the railroad company at Foxburg, which oil it was shown by the transit company's secretary, Mr. John Bushnell, belonged to the Standard Oil Company of New York, this particular oil was paid for on the following basis:

Starting with 68 cents as the through rate from the wells to Communipaw, via Foxburg, one-fourth of 68 cents, viz, 17 cents, went to the local pipe line (i. e., the Transit Company) "and one-fourth of the difference between this one-fourth (i. e., 17 cents) and the said public rate (i. e., 68 cents) shall be considered as due and to be paid to the railroad." The charge is worked out thus:

	Cents.
Local to Roxburg	20
Through to Communipaw (New York)	48
	68
One-fourth to local pipe	17
This leaves balance of	51
One-half of this balance to railroad company is	25½

The amount paid railroad company by Fenaille & Despeaux was	48
Amount paid by Standard to railroad company	25½
Rebate to the Standard Oil Company equals	22½

In other words, while the word "rebate" nowhere occurs in the agreement between the Transit Company and the railroad company, all the railroad company received was the 25½ cents per barrel

See paragraph 8 of the contract of May 6, 1881.

It is to be observed that this paragraph in terms only applies to cases where the through rate from the exit point of gathering pipe shall be less than 40 cents. This is the only provision in the contract, and in terms would apply to McCalmont and similar shipments, which were 33 cents per barrel. But not only is this the only provision in the contract for the division of the through rate between the transit company and the railroad company, but in addition thereto, the officers of both the railroad company and the Transit Company stated in evidence that the railroad company received payment from the Standard Oil Company of New York on the rail shipments from Foxburg to Communipaw under this contract, and received what the contract called for. It was further testified by these officials that what the railroad company got it collected directly from the Standard Oil Company of New York and that the railroad company received no money from the Transit Company on these shipments.

The evidence was to the same effect as to all rail shipments between McCalmont and Communipaw, Fenaille & Despeaux paying 20 cents local pipe rate and 33 cents open rail rate to Communipaw, making 53 cents in all.

The evidence further was that the Transit Company furnished to the railroad company crude oil of the Standard Oil Company of New York for carriage beteween McCalmont and Communipaw, for which the railroad company was paid directly by the Standard Oil Company the amount called for by this agreement of May 6, 1881.

Hence the railroad company charged Fenaille & Despeaux, between McCalmont and Communipaw, New York, 33 cents, and charged the Standard Oil Company 19.875 cents a barrel. This is worked out thus:

	Cents.
Local pipe rate	20
Open rate rail McCalmont to Communipaw	33
Through rate	53
One-fourth to local pipe	13.25
Balance	39.75
One-half of this balance paid by Standard Oil Company of New York to the railroad company	19.87

Under the contract of May 6, 1881, the railroad company was to be guaranteed one-third of the total movement of oil to New York.

Under a subsequent contract between the National Transit Company and the Pennsylvania Railroad Company, dated August 22, 1884, of which I have furnished you a copy, the railroad company was to be granted 26 per cent of the total movement of oil to the Atlantic seaboard, which would include Baltimore, Philadelphia, New York and Boston.

Prior to 1884 the railroad rates to seaboard, i. e., New York, were from Foxburg 48 cents, and from McCalmont 33 cents.

There was a difference in favor of Philadelphia of five cents per barrel.

From 1884 to 1887 the rail rate between Foxburg and similar points and Communipaw was 55 cents per barrel, and between Clarenden and Kane and similar points and Communipaw was 45 cents per barrel. There was a difference in favor of Philadelphia of five cents per barrel.

It was in evidence in the case of Ladenburg, Thalmann & Co. vs. The Pennsylvania Railroad Company, as to shipments between 1884 and 1887, under the contract of August 22, 1884, between the National Transit Company and the Pennsylvania Railroad Company that monthly settlements were made between the Transit Company and the railroad company, showing the total movement of oil to seaboard and the amount carried by the Pennsylvania Railroad Company on account of its 26 per cent allowance and then the deficiency on the 26 per cent (and there was always a deficiency) was settled between the transit company and the railroad company in this way:

I take for illustration the settlement made for the month ending September 30, 1884, as shown by a copy of the settlement certified to be correct by John Bushnell, comptroller of the National Transit Company:

Total number of barrels so transported	1,574,961	
Railroad company's share	409,490	
Amount carried by railroad	325,596	
Deficiency	83,894	
On this deficiency the railroad company was allowed on New York oil, at one-half of the current through rate, 45 cents, equals 22½ cents per barrel, on 43,665 barrels		$9,824.63
Less compensation allowed transit company for pumping the same, at 9 cents		3,929.85
Total		$5,894.78
The railroad company was allowed on Philadelphia oil for 40,229 barrels, at one-half current through rate, 40 cents, equals 20 cents per barrel		8,045.80
Less allowed National Transit Company for pumping same, at 8 cents		3,216.32
Total		$4,827.48
Total payment by the National Transit Company to the Pennsylvania Railroad Company for deficiencies for the month ending September 30, 1884		10,722.26

In the Fenaille & Despeaux there are two cases against the Pennsylvania Railroad Company, one for $10,778.56 and the other for $164,220.03. This is exclusive of interest and treble damages. In the small-

er case the treble damages were remitted in order to allow the plaintiff to call the officers of the defendant company as witnesses.

In the case of Ladenburg, Thalman & Co. against the Pennsylvania Railroad Company the amount claimed is $172,832.46 with interest and treble the amount of the claim for damages, also with interest.

Referring generally to the contract of August 22, 1884, that contract was for the purpose of keeping up the freight charges by making the rail rates and pipe rates the same.

You will observe, however, that if the Standard Oil Company of New York, on its shipment, went through the form of paying the full rates, inasmuch as practically all of the stock of the National Transit Company (viz 96 per cent.) belonged to the Standard Oil trust, it all came back again except the actual cost of pumping; and then you will observe that in the case of the railroad company it was only allowed one-half the current rates which were open to the public in the settlement made between it and the National Transit Company for monthly differences, as per the settlement above quoted.

Yours truly, JAMES W. M. NEWLIN.

George Rice, Esq., Astor House, New York City, N. Y.

Q. (By Mr. Jenks.) These cases referred to here, I understand, are still pending? A. Yes.

Q. (But they refer back to discrimination between the years 1881 and 1887? A. 1881, 1882 and 1883, I believe.

Q. But there is no discrimination since 1887 that is charged? A. I think not; I do not think there is any.

Q. Is this the original copy? A. That is the original signature.

RAILROAD MAGNATES INTERESTED IN STANDARD OIL.

(Reading:) "William H. Vanderbilt, who signed one of the contracts in behalf of the trunk line combine, was a stockholder in the Standard Oil Company as early as 1875 and it is fair to presume, under these circumstances, that he became one when these contracts were entered into. In 1875 John D. Rockefeller acted as attorney for Vanderbilt and also for Samuel F. Barger, his protege, to vote an increase of the stock of the Standard Oil Company.

"At same meeting Henry M. Flagler, secretary of said company, acted for the same purpose as attorney for Peter H. Watson, president of the Erie Railway Company, one of the combine. Vanderbilt testified August 27, 1897, before the Hepburn committee of New York that E. D. Worcester, treasurer of the Lake Shore and secretary of the New York Central, was a director in the United Pipe Lines, the pipe line branch of the Standard Oil monopoly, and that he held from $100,000 to $250,000 of its stock. At the same time Vanderbilt stated as follows:

"'Q. You were disgusted with them a long while ago' (meaning Standard officials)? A. 'I was, because I said if the thing kept on the oil people would own the roads instead of the roads owning them.'

"He also said: 'I don't believe that by any legislative enactment or anything else through any of the states or all of the states you can keep such men as them down.'

"These were strong words for a Vanderbilt to say, and also how prophetic, for William Rockefeller, vice president of the Standard Oil trust, has just been elected director in the New York Central and Hudson River Railroad Company, to take the place of Cornelius Vanderbilt, lately deceased. Since his advent he has been made a member of the executive committee, and on October 23 the issue of $15,000,000 additional stock was authorized, and all this within a few weeks only after the death of Cornelius Vanderbilt, the son of the late William H. Vanderbilt, who testified that he did not believe that even "by any legislative enactment or anything else through any of the states you can keep such men as them down.' He was in truth prophetic, and it has dramatically reached his own family.

"Hugh J. Jewett, recent president of the Erie Railway Company, who died in March, 1898, left by his will to his sons and daughters equal shares of his holdings in the trust certificates of the Standard Oil trust.

"Clement A. Griscom, for many years a director in the Pennsylvania Railroad Company, testified on April 30, 1888 (p. 395), before a congressional committee, that he then was president of the National Transit Company, the principal pipe line company in the Standard Oil trust, with over $25,000,000 of capital, and had been so connected since its formation in 1881 or 1882.

"This clearly proves my assertion that rebates or freight discriminations created the Standard Oil monopoly, out of which came forth in 1882 the great Standard Oil trust, the originator of all the other trusts, receiving corresponding rebates on the transportation of general products, the resulting effects of which are that about nine-tenths of the commerce of the country is controlled by a score of men, who dictate and exact from the masses high tariff transportation rates, while their own goods are carried at nominal figures, which is nothing more or less than the levying of an embargo or secret indirect heavy confiscation tax upon general production and manufactured products, in the interest of a few men, to the destruction of all private industrial interests, with large depreciation also of personal and realty holdings.

"MY EXPERIENCE.

"In 1876 I commenced the refining of petroleum with a capacity of 500 barrels per week, and later on increased same to 2,000 barrels a week, or 100,000 barrels per annum. In 1879 I became interested in an investigation by the Ohio legislature of freight discriminations, which came to naught, and practically had no appreciable effect, although it was proven that independent refineries at Marietta had to pay 50 per cent more freight than did the Standard Oil monopoly. Being thus shut out of the markets to the north, east and west, I turned my attention to the south, when I was again peremptorily brought up with a short and decisive turn by an attack of the

railroads at both ends of the line, through the tireless, smokeless rebate or freight discriminations, not only upon the manufactured products, but also upon the transportation of crude petroleum to my refinery.

"Outside of rebates or freight discriminations I had no show with the Standard Oil trust, because of their unlawfully acquired monopoly, by which they could temporarily cut only my customers' prices, and below cost, leaving the balance of the town, nine-tenths, uncut. This they can easily do without any appreciable harm to their general trade, and thus effectually wipe out all competition, as fully set forth. Standard Oil prices generally were so high that I could sell my goods two to three cents a gallon below their prices and make a nice profit, but these savage attacks and cuts upon my customers' goods and their consequent loss plainly showed them their power for evil and the uselessness to contend against such odds, and they would buy no more of my oil.

Q. (By Mr. Ratchford.) A question there, if you please. At the beginning of that paragraph you said that, outside of rebates and freight discriminations, you have no show with the Standard Oil trust? A. Yes, I say that. I mean by that their power of monopoly. That is, by their getting this great wealth, they can jump right on my cars of oil, outside of rebates or freight discriminations. They can clean me out on any one car I may send to any one town.

Q. Is it not a fact that your contention is that the Standard Oil Company has its greatest advantage over you and other indepednent producers in the matter of rebates and freight discriminations? A. Certainly, that is the whole thing.

Q. You say that outside of this they have a great advantage over you. Where is it? A. They get this great power through these rebates and from discriminations. They, for instance, could lose a moderate amount of money in any one town, which would not affect all the rest. That is what I had reference to in that.

"PLEASE TURN ANOTHER SCREW.

(Reading:) "In 1881 a Standard official wrote to J. M. Culp, the general freight agent of the Louisville and Nashville Railroad Company, to turn another screw upon shipments, which they did in five days, exacting from me 50 per cent more freight, which shut me out of the Tennessee markets."

I have the original letter if you would like to see it.

(By several of the commissioners.) Yes.

The witness. I think I have a fac simile of it, too. It is a very nice letter to see. Here is the original. I will present this to the chairman, and here is the fac simile of the original.

Q. (By Mr. Smyth.) This was before the interstate commerce law? A. Yes, certainly; but that does not help them out Rebates were unlawful before the interstate commerce law, just as unlawful as they are now.

Q. Were the letters Mr. Archbold read regarding rates before 1887? A. I will come to freight discriminations since 1887 in my own cases.

Q. (By Mr. Clarke.) Can we not have this letter read?

The witness. I will read it. Chess, Carley & Co., who signed this letter, were a branch of the Standard Oil Company at that time, and they wrote a letter to J. M. Culp, who was general freight agent of the Louisville and Nashville railroad. This is the original stamp of receipt by the hailrail company: "J. M. Culp, general freight agent."

Now, before I read this letter I want to say that Wilkinson & Co. were my agents in Tennessee.

Chess, Carley & Co., Louisville.

J. M. Culp, Esq., G. F. A.

Dear Sir: Wilkinson & Co., Nashville, received car of oil Monday, 13th, 70 bbl., which we suspect slipped thro' on the *usual* 5th class rate—"in fact, we might say," we know it did—paying only $41.50 freight from here. Charges $57.40. Please turn another screw.

Yours truly, CHESS, CARLEY & CO.

June 16, '81.

That screw was turned on me to the extent of 50 per cent in five days.

Q. (By Senator Kyle.) That contract he speaks about was the same as charged the Standard Oil Company to that point, was it? A. Yes; I suppose it was.

Q. (By Mr. Jenks.) $41.50? A. Well, let us say $41.50; I do not know about that, whether the same as charged, $41.50.

Q. (By Senator Kyle.) You have not an inside rate? A. No.

Q. (By Mr. Farquhar.) Is not $41.50 the open rate? A. No; I will tell how it is. The $41.50 is the rate from Louisville to Nashville and the $57.40 was the previous rate from Marietta to Louisville.

Q. (By Mr. Phillips.) Then do I understand that they added 50 per cent after that? A. Yes; 50 per cent; the road raised the rates on me, but they did not on the Standard.

Q. (By Mr. Farquhar.) Did they make that rate? A. No; that was the open tariff rate.

Q. It was not a discriminating rate particularly against your product in this matter, but they had made a new rate for all? A. Why, yes, certainly; the tariff rates are published rates. I paid tariff rates and the Standard paid less rates.

Q. (By Mr. Phillips.) Was there any other competitor considered at that time but yourself? A. I do not recollect now. I think I was about the only competitor about that time; that is my impression; it was a good many years ago. I do not recollect.

Q. (By Mr. Clarke.) How do you know that they did not make the same rate to the Standard? A. I do not know, but it is fair to presume they did not on all past experience. I do not know it certainly. I can not prove it; it is a pretty hard thing to prove rate discriminations.

Q. (By Senator Kyle.) You do not think they intended to turn another screw on themselves? A. I do not think so.

Q. (By Mr. Smyth.) I should think that if you could get this letter, you might find out how much the Standard Oil Company paid. A. I guess one would have a nice time doing that. I would like to see you come here and bring an action in court and get them to show their books.

Q. You had a nice time in getting this letter? A. Yes, I did.

Q. I thought that if you could get that from the railroad you could find out what the rates were? A. You can not sue a railroad; you can not get their books.

Q. I was only comparing. It seemed to me that if you could get that letter you could also find out what the rates were? A. How could I? What good would that do?

Q. That is what I want to know. I do not know how you got this letter. A. No.

Q. If you were able to get the private correspondence of the railroad company, why are you not able to find out what their private rates are? A. Some things are impossible, and that is one of them. It is a mighty hard thing to find out rebates.

Q. The rates must be on the books, you know; it must show in some way. A. I do not know about that, whether it shows on the books or not.

Q. (By Mr. Farquhar.) Of your own knowledge, do you know that other parties had to pay this particular rate the same as you had to? A. I do not know that, but if they shipped they would; of course they would.

Q. It was well understood that that was the rate made and given out to all shippers? A. I have always shipped on tariff rates, and of course they were public to everybody.

THE CLEVELAND AND MARIETTA RAILWAY CASE.

(Reading:) "Phineas Pease, receiver of the Cleveland and Marietta Company, under the jurisdiction of a United States court, suddenly doubles its crude petroleum freights on me, without previous notification or warning, from 17½ cents a barrel to 35, in the carriage of same 25 miles from the oil producing fields of Macksburg to Marietta, Ohio, where my refinery was located, while at the same time he makes a rate to the Standard Oil trust of 10 cents a barrel, or 250 per cent of a discrimination against my shipments."

Q. (By Mr. Smyth.) What proof have you of that? A. You will see it right along as I come to it; there is plenty of it.

(Reading:) "Not satisfied with that, the trust demanded of the receiver, in addition thereto, under threat to remove its business from his road, that the 25 cents per barrel so paid by Mr. Rice in excess of tariff rates be paid over to the Standard Oil trust for the privilege of the road having its business to do, and it was so paid. In other words, Mr. Rice was compelled not only to pay his own freight, but the freight of his rival in the business, and 15 cents per barrel to his rival besides, for the privilege of living and doing business.

"To be sure of its victim and secure the spoils the Standard Oil trust pay the local railroad freight agent at Marietta $25 per month to collect and turn over to the trust this enforced freight contribution, which he did."

The witness. I will put in as exhibits extracts from two letters to prove both statements.

Pease to Rapello, February 25, 1885.

"But Mr. O'Day compelled Mr. Terry to make a 35-cent rate on all other oil going to Marietta and that we should make the rebate of 25 cents per barrel on all oil shipped by other parties, and that the rebate should be paid over to them (the Standard Oil Company), thus giving us 10 cents per barrel for all oil shipped to Marietta, and the rebate of 25 cents per barrel going to the Standard Oil Company, making that company, say, $25 per day clear money on Mr. George Rice's oil alone.

"In order to save the oil trade along our line, and especially to save the Standard Oil trade, which would amount to seven times as much as Mr. Rice's, Mr. Terry verbally agreed to the arrangement, which, upon his report to me, I reluctantly acquiesced in, feeling that I could not afford to lose the shipment of 700 barrels of oil per day from the Standard Oil Company. But when Mr. Terry issued instructions that on and after February 23 the rate of oil would be 35 cents per barrel to Marietta, Mr. George Rice, who has a refinery in Marietta, very naturally called on me yesterday and notified me that he would not submit to the advance, because the business would not justify it, and that the move was made by the Standard Oil Company to crush him out. (Too true.) Mr. Rice said: 'I am willing to continue the 17½-cent rate which I have been paying from December to this date.'

"Now the question naturally presents itself to my mind, if Mr. George Rice should see fit to prosecute the case on the ground of unjust discrimination, would the receiver be held, as the manager of this property, for violation of law? While I am determined to use all honorable means to secure traffic for the company, I am not willing to do an illegal act (if this can be called illegal), and lay this company liable for damages. Mr. Terry is able to explain all minor questions relative to this matter.

"Hoping for your careful consideration of this matter and an early reply, I remain, sir, truly yours,

P. PEASE,
"Receiver and General Manager."

Rapello to Pease, March 2, 1885.

"That company also owns the pipes through which oil is conveyed from the wells, owned by individuals, to your railroad, except those pipes leading from the wells of Mr. George Rice, which pipes are his own.

"The company has or can acquire facilities for storing all its oil until such time as it can lay pipes to Marietta and thus deprive your company of the carriage of all its oil. The amount of oil shipped by Mr. Rice is comparatively small; say a quantity sufficient to yield $300 per month for freight.

"The Standard Oil Company threatens to store, and

afterwards pipe, all oil under its control unless you make the following arrangement, viz: You shall make a uniform rate of 35 cents per barrel for all persons exceping the Standard Oil Company; you shall charge them 10 cents per barrel for oil, and also pay them 25 cents per barrel out of the 35 cents collected from the other shippers.

"You must agree to carry all such oil of the Standard Oil Company or of others delivered to your road, through their pipes at 10 cents per barrel. You may also charge all others shippers 35 cents per barrel freight, even though they deliver oil to your road through their own pipes; and this, I gather from your letter and from Mr. Terry, would include Mr. Rice.

"You are at liberty, also, to arrange for the payment of a freight by the Standard Oil Company, calculated upon the following basis, viz: Such company to be charged an amount equal to 10 cents per barrel, less an amount equivalent to 25 cents per barrel upon all oil shipped by Rice, the agreement between you and the company thus being that the charge to be paid by them is a certain sum ascertained by such a calculation. If it is impracticable so to arrange the business that the Standard Oil Company shall, in effect, collect 25 cents per barrel from those persons using the company's pipes from the wells to the railroad without its passing into your hands, you may properly also deduct from the price to be paid by the company an amount equal to 25 cents per barrel upon the oil shipped by such persons.

"Provided your accounts, bills, vouchers, etc., are consistent with the real arrangement actually made, you will incur no personal responsibility by carrying out such an arrangement as I suggest.

"It is possible that, by a proper application to the court some person may prevent you in future from permitting any discrimination. Even if Mr. Rice should compel you subsequently to refund to him the excess charged over the Standard Oil Company, the result would not be a loss to your road, taking into consideration the receipts from the Standard Oil Company, if I undertsand correctly the figures. There is no theory, however, in my opinion, under the decisions of the courts relating to this subject, upon which, for the purpose, an action could be successfully maintained in this instance.

Yours truly, EDWARD S. RAPELLO."

Now I will read Judge Baxter's decision (reading): United States Judge John Baxter delivers the following opinion of the court in Handy et al. vs. Cleveland and Marietta Railway Company et al. (Federal Reporter, vol. 31, p. 692. Circuit court, southern district of Ohio, E. D., 1897):

"It appears that the Standard Oil Company and George Rice were competitors in the business of refining oil; that each obtained supplies in the neighborhood of Macksburg, a station of said railroad, from whence the same was carried to Marietta or Cleveland, and that for this service both were equally dependent on the railroad, then in the hands of the receiver.

"It further appears that the Standard Oil Company, desired to 'crush' Rice and his business, and that, under a threat of building a pipe for the conveyance of its oil and withdrawing its patronage from the receiver, O'Day, one of its agents, 'compelled Terry,' who was acting for and in behalf of the receiver, to carry its oil at 10 cents per barrel and charge Rice 35 cents per barrel for a like service and pay it 25 cents out of each 35 cents thus exacted from Rice, 'making,' in the judgment of the receiver, '$25 per day clear money' for it 'on Rice's oil alone.'

"But it is due to the receiver to say that, notwithstanding his admitted 'reluctant acquiescence' in the contract made by Terry on his behalf, and the indorsement thereof by Rapello and the further conceded fact that he charged the Standard Oil Company 10 cents and Rice 35 cents per barrel, as aforesaid, he denies that he ever paid to the Standard Oil Company any part of the money ever received from Rice. We will therefore, for the present accept his affirmation touching this matter as true."

In a parenthesis I have stated here "Subsequent proceedings proved the statement of the receiver in this respect was false." (Reading:) "But why should Rice be required to pay 250 per cent more for the carriage of his oil than was exacted from his competitor? The answer is that thereby the receiver could increase his earnings. This pretense is not true. But suppose it was would that fact justify, or even mitigate the injustice done to Rice? May a receiver of a court, in the management of a railroad thus discriminate between parties having equal claims upon him, because thereby he can accumulate money for the litigants? It has been repeatedly adjudged that he can not legally do so. Railroads are constructed for the common and equal benefit of all persons wishing to avail themselves of the facilities which they afford. While the legal title thereof is in the corporation of individuals owning them and to that extent private property, they are, by the law and consent of the owners dedicated to the public use. By its charter and the general contemporaneous laws of the state, which constitute the contract between the public and the railroad company, the state, in consideration of the undertaking of the corporators to build, equip, keep in repair and operate said road for the public accommodation, authorized it to demand reasonable compensation, from every one availing himself of its facilities, for the services rendered. But this franchise carried with it other and correlative obligations. Among these is the obligation to carry for every person offering business, under like circumstances, at the same rate. All unjust discriminations are in violation of the sound public policy and are forbidden by law."

This was before the interstate commerce act.

(Continuing reading: "We have had frequent occasions to enunciate and enforce this doctrine in the past few years. If it were not so the managers of railways, in collusion with others in command of large capital could control the business of the country, at least to the extent that the business was dependent on railroad transportation for its success, and make and unmake the fortunes of men at will.

"The idea is justly abhorrent to all fair minds. No such dangerous power can be tolerated. Except in the mode of using them, every citizen has the same right to demand the services of railroads on equal terms

that they have to the use of a public highway or the government mails; and hence, when in the vicissitudes of business a railroad corporation becomes insolvent and is seized by the court, and placed in the hands of a receiver to be by him operated pending the litigation and until the rights of the litigants can be judicially ascertained and declared, the court is as much bound to protect the public interests therein as it is to protect and enforce the rights of mortgagors and mortgagees. But after the receiver has performed all obligations due the public and to every member of it—that is to say, after carrying passengers and freight offered for a reasonable compensation, not exceeding the maximum authorized by law, if such maximum rates shall have been prescribed, upon equal terms to all—he may make for the litigants as much money as the road thus managed is capable of earning. But all attempts to accumulate money for the benefit of the corporators or their creditors by making one shipper pay tribute to his rival in business at the rate of $25 per day or any greater or less sum, thereby enriching one and impoverishing another, is a gross, illegal and inexcusable abuse of a public trust that calls for the severest reprehension.

"The discrimination complained of in this case is so wanton and oppressive it could hardly have been accepted by an honest man having due regard for the rights of others, or conceded by a just and competent receiver, who comprehended the nature and responsibility of his office; and a judge who would tolerate such a wrong or retain a receiver capable of perpetrating it ought to be impeached and degraded from his position.

"A good deal more might be said in condemnation of the unparalleled wrong complained of, but we forbear. The receiver will be removed.

"The matter will be referred to a master to ascertain and report the amount that has been as aforesaid unlawfully exacted by the receiver from Rice, which sum, when ascertained, will be repaid to him. The master will also inquire and report whether any part of the money collected by the receiver from Rice has been paid to the Standard Oil Company, and if so, how much, to the end that if any such payments have been made suit may be instituted for its recovery."

Q. (By Mr. Jenks.) This is the formal decision of the court? A. Simply.

Q. (By Senator Kyle.) What was the outcome of the matter? A. The court appointed a master commissioner, who is the present elected governor of Ohio, George K. Nash. The court appointed him a master commissioner to investigate this matter, and he found these to be the facts of the case as I have stated them here.

Q. (By Mr. Jenks.) Did you collect the money over? A. Yes. It was not very much. I got onto it right quick, so it did not injure me much. As soon as they doubled the rate of freight on me I thought there was something wrong. I immediately went to Cambridge, to the headquarters of the road, in person, to see the receiver, and asked him why my freight rates had been doubled. He pretended to know scarcely anything about it. He says: "That is a matter that belongs to the freight agent. I understand there has been an advance. I understand it is necessary that the road should have more revenue." That is the substance of the interview; but he gave me to understand that the rates were going to remain. He did not give me any good reason why they were advanced, but I of course thought there was something up, and I went back and got up a correspondence with him to put him down on paper to see where he would land, whether he would make any evasions or give me some reasons by which I could find out what the trouble was. He made some replies that were not to the point, and I had counsel at Marietta write to Judge Baxter, who had charge of this road of which Phineas Pease was receiver, asking if a private hearing could not be had before him in chambers upon what these letters showed. He granted the request at once. I went down to Cincinnati with my attorney, and the local attorney of the road went down, and he owned up the whole business right there before Judge Baxter, although this thing had passed through the hands of ex-Judge Rapello, of New York city, who was then the leading counsel of the road. That is the way it came out.

Q. (By Mr. Farquhar.) Do you know whether it was customary in those days, before the interstate commerce law was passed, for the receivers usually under instructions from the courts to get all out of a road it was possible to get for the benefit of the stockholders? A. I do not know anything of that kind. I do not think, though, that any receiver of a road should charge any less to a big shipper than to a small shipper, because it violates the law, the common law of the land, which no road had a right to do even before the interstate commerce law, as Judge Baxter says here. It was just as bad before 1887; it was unlawful. As I understand it, the only additional thing that was put into the interstate commerce act was the penalty clause, by which every shipper and every carrier is subject to a penalty of $5,000 and two years in the penitentiary for each and every offense. And what good has it done? They discriminate every day just as much as they ever did. It has had no effect whatever, and I can show it as I go along here by my own cases before the interstate commerce commission.

Q. Has it not been a fact that there were some very great discriminations made by receivers in giving rates? A. I do not know that.

Q. As against all competing roads, and the court itself would sustain them in working for the benefit of the stockholders, to get all the revenue it was possible to get out of it? A. No; I do not think that any honest judge would ever decide that a railroad could discriminate in favor of a large shipper against the small shipper.

Q. Is it not a fact that in some cases receivers have discriminated and cut rates on their road? A. Right there in my own case they did; and here are Receivers Cowen and Murray admitting it themselves, when they wrote the letter to the interstate commerce commission, December, 1898, that they were giving rebates; criminally doing it.

Q. (By Mr. Ratchford.) Is it not a fact that the managers of railways generally follow that practice,

discriminating in rates to all large shippers and giving them inside prices? A. Why certainly.

Q. That is your observation, is it? A. Yes, certainly.

Q. That being the case, does it not follow that receivers necessarily have to resort to the same practice in order to compete? A. Well, I do not think that receivers of a railroad ought to violate the law. No man ought to; but in particular receivers of a road. It does not make any difference how it strikes the road.

Q. Do you recognize their inability to compete in case they do not resort to the same practice? A. Very likely they do. But the receiver is specially appointed by the court, and it is supposed that the courts do not want to sanction any unlawful act. I mean to say there is a greater obligation on receivers of a railroad not to discriminate, because they are appointed by the court and are under the jurisdiction of the court. Supposing the railroad does lose freight—that is no reason; they must obey the law. That is the trouble with the country—our laws are not obeyed nor enforced.

THE STANDARD GOES INTO THE GROCERY BUSINESS.

(Reading:) "Threats and intimidations, highwayman tactics, used by the Chess Carley Company (Standard Oil) on my agents, that 'competition will not be confined to coal oil or any one article.' Also 'that the Standard Oil Company had authorized him to spend $10,000 to break up any concern that bought oil from any one else."

Now I refer to one of my exhibits, B. p. 84, for that.

Q. (By Mr. Jenks.) Perhaps you can state in a word what the substance of this is and then put it in as an exhibit; it will save you some time? A. Well, it is merely that the Chess Carley Company wrote my agents, Wilkinson & Co., at Nashville, threatening letters, of which I have copies in my exhibits. They had tried to buy them out, and made threats that if they did not come to time they would not only cut the prices of oil, but all the general goods that they sold; that was the substance of it, but I have it all here.

Q. I understand from what you have said elsewhere that they did, as a matter of fact, set up a separate grocery store? A. Oh, no, not at that point; that was at another place; that was in Mississippi.

Q. But that was this same company that did subsequently set up a grocery store? A. Yes.

Q. In order to drive the rivals out? A. That is right; this same company.

(Reading:) "Rust proof oats, meats, sugar, coffee used as weapons by the Standard Oil monopoly to kill off competition.

"R. M. Fraser, general freight agent of the Marietta and Cincinnati railroad, wires a Standard official as follows: '———, at Marietta, is inquiring for rates of freight on oil to Chillicothe. Don't you control that field?' Colonel Thompson (he was a Standard official) to Mr. Fraser: 'Yes. that is our meat.' (B 85.)"

Q. (By Mr. Smyth.) Will you give us the date of that telegram? A. I do not know whether I have the date. I refer to B. 85. I do not know whether there is a date to it or not; but it is all true, all the same.

Q. (By Mr. Farquhar.) This occurred in 1881, did it not? A. I guess along in there. I calculated that all these things where there were not dates would come along about in chronological order.

Q. Did you get the name that you had left blank in the body of the telegram? A. Well no; I did not get the name. It came over my wire, and a friend of mine hearing it going over the wire, gave it to me. He was a telegraph operator himself.

(Reading.) "Standard Oil also establishes a grocery house at Columbus, Miss. and sells groceries at cost in order to force merchants to buy their oil. (B. 86.)"

There is quite an extensive account in connection with that.

Q. (By Senator Kyle.) How prevalent is that custom with the Standard Oil Company? A. It is not so prevalent now, because they are establishing their agencies all over the United States—and they do not have to go into that kind of work.

Q. Threats are made and have been made—they resort to threats? A. Oh, yes; there is no trouble about that.

RATES DOUBLED FOR MR. RICE, UNCHANGED FOR THE STANDARD.

(Reading.) "The Standard Oil Trust makes contract with a merchant of New Orleans to pay him the sum of $48,000 not to handle my oils, and while I was down there to establish another agency I was apprised by wire that my rates to Memphis and New Orleans were doubled without previous warning."

That was to discourage me from establishing another agency; but I did it, all the same. I went on and got another man to take hold, and when I got back to Cincinnati I stopped off to find out what it meant. I called upon the general freight agent of the road, and he said that the connecting line was all the trouble. You know the initial line makes the rate, and Mr. Fraser was the general freight agent of the initial line out of Marietta, but he made the excuse that the connecting line caused the trouble. I did not get any satisfaction, and I said that I would like to see the president of the road, Mr. Orland Smith. I said, "Mr. Smith, why has my freight rate been doubled all at once without any warning?" He did not seem to know anything about it, but I guess he did. He called Mr. Fraser in and said, "What is this trouble with Mr. Rice about these rates?" Mr. Fraser said, "The connecting lines have been writing us that they must have their freight rates advanced; they could not see any other way to do." Well, what do you suppose they did? After two or three months correspondence they restored my rate, but in the following year they put up a job on me that stood, by which on July 15, 1886, they set up a rate on my shipments, on all of my shipments—they were all from Marietta—from 43 to 162 per cent. They never raised the rates on the Standard Oil Company one

cent, which had a big refinery at Parkersburg, 12 miles from Marietta. The tariff rates from both points were exactly equal. On subsequent investigation I got the attorney-general of Ohio to bring an action and I bore all the expenses of it, to forfeit the charters of the Cincinnati, Baltimore and Washington Railroad and the Queen and Crescent Road for these accursed discriminations. I spent a lot of money and it took a lot of time, and I got a verdict from the supreme court after a while saying that they should not do it any more; and it did not amount to anything. They continued to do it right along under my nose. And it shut up 19 agencies out of 24 and shut me out of 39 towns in 73 in five months; that is what it did. And these men here, Orland Smith and R. M. Fraser, are responsible for this collusion to ruin my business.

Q. (By Mr. Farquhar.) What year was this thing in? A. In 1886.

Q. (By Mr. Smyth.) Were the published rates the same from Parkersburg as from Marietta? A. Yes.

Q. You believe that the Standard Oil Company received a rebate? A. I proved 43 to 162 per cent. I went into court and proved it before a referee. There were two suits to forfeit the charters, and the court said they could not do this any more. It was a very fine, sweet verdict. Of course, it had no effect.

Q. (By Mr. Jenks.) In connection with the statement that the Standard Oil Trust made a contract with a merchant of New Orleans to pay him the sum of $48,000 not to handle the oil, in the exhibit that is given, you set out the contract in full? A. Yes.

Q. You are perfectly certain as to the trustworthiness of this? A. Yes, of course; because I got the facts right from the party, Mr. Ong. I got the contract; without a question these are genuine contracts.

Q. Mr. Ong gave you the contracts? A. Oh, yes; they are absolute facts. They are the contracts without a question. These are the genuine contracts.

(Reading:) "October 15, 1886, a friend of mine writes me from Cleveland as to inside rates given to the Standard Oil Trust as follows: 'They say that they only get so many tons of freight and so many dollars and cents in payment of so much tonnage. Can't tell whether in barrels or tank cars.' "

(Reading) "The general freight agent of the Little Rock and Memphis Railroad Company wrote me November 17, 1890, as follows: 'We are handling your oil. This, of course, we expect, as common carriers, to be compelled to do. It is a fact, nevertheless, that on account of handling your oil the Standard Oil Company will not route any of their freight over our lines. As a consequence, we have none of their tanks.' "

That is very nice.

(Reading:) "By the power and fear of the Standard Oil Trust I have paid five cents a barrel more for crude oil than the regular established market price of the trust for additional stock to run my refinery."

TANK CAR DISCRIMINATIONS.

"Can't purchase tank cars except for cash, because of my 'supposed controversy' with the Standard Oil Company."

Office of the Milton Car Works,
Milton, Pa., December 6, 1887.

George Rice, Esq., Marietta, Ohio.

My Dear Sir: We have just wired you as follows: "Our financial friends decline to advance the money. We can not build them except for cash," which we confirm.

Our Mr. Dickerman returned this morning and after using every exertion, failed to negotiate the deferred payments on your cars. Our financial friends state that they have declined to do this mainly on account of some supposed controversy which they claim you have had with the Standard Oil Company and various railroads in the west. They feared you could not use these cars to advantage if the railroads should be hostile to your interests.

We regret this very much as we have been to considerable trouble and expense in making arrangements to build cars, and are now seriously disappointed at the refusal of the parties to take deferred payments, as they had partially promised to do.

We should be very much pleased to build these cars for you if you can negotiate the notes with your friends and pay us the cash.

Please let us hear from you at your earliest convenience concerning your ability to raise the money.

Yours, very respectfully,
Murray, Dougal & Co., Limited.

You see there was a discrimination in the carriage of oil in barrels as against tank cars of about 25 per cent; and if anybody could afford to buy tank cars—rolling stock for the railroad—of course, shippers ought to furnish railroads all the cars they want and let them charge what they please—so I saw that it was necessary to get hold of some cars. The way it is generally done is, a person goes and contracts for tank cars and pays down 20 or 25 per cent, and then pays the balance in installments in four or five years; and they hold the title to the cars.

Q. (By Mr. Farquhar.) Yet this is a business letter from Murray, Dougal & Co.; that if you would furnish the cash they would build the cars? A. Yes, but the trouble was that that would take just so much money out of my business, and, of course, cramp me so much that I could not afford to do it.

Q. You went into the building of tank cars afterwards, later on—got the Pennsylvania works to build them for me and paid 20 or 25 per cent down, and the balance in five years.

Q. Do you think it was an advantage to the Standard Oil Trust to have the tank cars built? A. Well, that might be, if everybody got the same rate,

if the railroad would furnish the same tank cars; but they did not furnish the tank cars. The Standard Oil Company in the early days bought up all the tank cars from the railroads, and no doubt with the understanding that they must not build any more tank cars. The railroads have not furnished tank cars to the shippers, who thought they ought to do it, and they had to put box cars on, just as the Pennsylvania road did for years and years; and after the interstate act went into effect, the Standard got them to charge for the weight of the wooden package.

Q. You made quite a contention there, did you not, for a long time against the tank cars? A. Why, certainly. It is all right enough if the roads would only furnish that means of carrying, but they would not do it; and they know that the independent refiners of small means can not afford to buy tank cars. Why should they not do this? It is the duty of the railroad to furnish all the cars that are necessarry. It is a freeze out, that is all.

Q. That is the question we are reaching now. You know the private car system of the United States today; they are used in transportation, refrigerator cars, and everything of that kind, furnished by private corporations. Was it not a positive advantage to have tank cars in the transportation of oil? A. No, I do not think it was. I think it was the greatest possible evil in petroleum transportation, for the reason that the railroads carried tank cars of oil for the Standard Oil Company at a lump sum tank rate. I proved that before the Inter-State Commerce Commission, between barrel rates and tank car rates; that I paid four times as much to Birmingham, Ala.

Q. Where they were able to furnish tank cars, did not the railroads try to discourage the barrel? A. I can not answer. Why should they?

Q. I can not say that. Was it not a condition while you were shipping? A. Yes, they did. I will say that they did it for the purpose of freezing out the refiners; I will answer that, "Yes." They did it certainly, because they wanted to discourage the smaller ones; because the railroads and the trusts all work hand in hand together; each one owns the stocks and bonds of the other, and they are all working in collusion and in conspiracy to freeze out all competition.

Q. Did any railroads ever propose that you should put on your cars and they would pull them for so much a mile; did they ever refuse you at all? A. Yes. I have had railroads that refused; I forget what the lines were.

Q. Some roads did not? A. Why ,certainly; I will tell you something about the tank car business. In 1878, J. H. Rutter, the general freight agent of the New York Central and Hudson River Railroad, in an investigation before the Hepburn committee of the New York legislature, put in a special tariff sheet of rates for the Standard Oil Company, and in that tariff was a particular special rate on tank cars of $60 per tank car, lump sum, from Cleveland to New York, which would be 60 cents a barrel. The outside rate was $1.90 a barrel to all competitors. They also got a reduction off that 60 cents for the carriage of crude oil from the oil regions to the refineries at Cleveland, 35 cents per barrel of crude oil. Fourteen barrels of crude at 35 cents were allowed for 10 barrels of refined shipped from Cleveland to New York. That made $4.90 drawback. The freight on 10 barrels, at 60 cents a barrel, would be $6; $6 less $4.90 drawback is $1.10, for transporting 10 barrels of oil from Cleveland to New York. That is 11 cents a barrel as against $1.90, or 1,600 per cent discrimination.

Q. (By Mr. Smyth.) Do you know any railroad in this country that owns tank cars? A. I think the Pennsylvania Railroad has a lot of tank cars, or did have; but in the early days it was almost impossible for a competitor to get the use of them; the Standard Oil Trust had practically the exclusive use of them.

Q. Is it not the custom in all oil refineries, both in petroleum and cotton seed oil, that the tank cars are owned by the refiners? A. Yes; to a certain extent I think the cotton seed oil refiners are owning their own cars.

Q. And the railroad companies do not furnish any cars? A. I think not.

Q. (By Mr. Ratchford.) You are aware that the representatives of the Standard Oil Company have stated before this commission that no such thing as rebates were given them—— A. (Interrupting:) Since the interstate commerce act?

Q. Yes. A. Yes; I will come to that.

Q. And the claims that you have just mentioned, referring to the rate from Cleveland to New York, you should support by the strongest possible testimony that you can present. Proof is what we want. A. Well, I am going to give it to you as I go along. I am going to give you plenty of proof as to freight discrimination since the interstate commerce law went into effect. I was coming to that; I have not got to that yet.

(Reading:) "I have for years vainly sought Government protection through Congress and the Interstate Commerce Commission, and get it not; also through State legislatures, and get it not; through the courts, and get it not. Soon there will be trouble in this land if this nefarious work does not cease, for anarchy will be supreme. The railways and the trusts are run conjointly on a fraudulent, dishonest, and destructive basis. The channels of trade and transportation are no longer open free to the people at large. Our greatest criminals and corruptionists are at the head of these mighty and all-powerful institutions, who also use their vast resources to corrupt our politics. They have no fear of the law, because of the fabulous fortunes so easily and quickly obtained, from which they expect to buy immunity.

"It is quite evident our Government is a failure, because of non-enforcement of our laws against this piratical crew who infest our inland commerce under the secret cover of unlawful rebates and commissions and thus rob the people out of hundreds of millions of dollars.

"The trusts are worse than the pirates of the seas, for they sailed in the open; and, though they gave

no quarter, they did their work under their own pirate flag, and not under the livery of the law.

"I have had a number of applications from unknown correspondents to take hold of new oil developments in different States, and have invariably replied that it would be useless, that however prolific an oil field might be, it would be made unprofitable and no money in it, as against the power of the Standard Oil Company monopoly over the rail lines of this country."

Whereupon at 1 p. m. the commission took a recess until 2 o'clock p. m.

The commission met at 2.15 p. m., Chairman Kyle presiding. George Rice again on the stand and examination resumed.

Q. (By Senator Kyle.) You may proceed. (Reading:)

"John D. Archbold and Henry H. Rogers, trustees of the Standard Oil Trust, testify before this commission, September 8 and 9, that this trust has not received discriminating freight rates since the interstate commerce act took effect, April 5, 1887.

"In 1886 I entered complaints with the attorney-general of Ohio to forfeit the charters of the Cincinnati, Washington and Baltimore, and Cincinnati, New Orleans and Texas Pacific railways for gross freight discriminations. The petitions were filed December 23, 1886, and depositions filed November 23, 1887. The referee made his report July 3, 1889, and the supreme court rendered its decision March 4, 1890. I proved that the Cincinnati, Washington and Baltimore Railroad Company, the initial line out of Marietta, and governing connecting lines, issued an order to take effect July 15, 1886, by which freight rates were not only advanced, but that my shipments were discriminated against by this road in favor of the Standard Oil Trust from 43 to 162 per cent.

"That the Cincinnati, New Orleans and Texas Pacific had so discriminated from 29 to 212 per cent. That the Louisville and Nashville Railroad Company had so discriminated from 35 to 260 per cent. That the St. Louis, Iron Mountain and Southern Railway had so discriminated from 48 to 191 per cent, which continued at least to March 4, 1890, and probably much longer, regardless of the order of the commission. These unlawful freight discriminations had the effect to close up 19 out of 24 of my agencies, and shut me out of 39 towns in 73 within five months.

"The supreme court of Ohio, after this abundant and most extraordinary proof before them, ignored the people's sacred right of eminent domain, and simply decided that these roads be ousted from charging less rates per 100 pounds on tank car shipments, as compared with barreled oil, which decision proved ineffective."

This suit was to forfeit their charters for these discriminations.

DISCRIMINATIONS AT LEAST UP TO 1888.

"In November, 1887, before the Interstate Commerce Commission, I proved the following gross freight discriminations, which were exclusively in favor of the Standard Oil Company and for no one else. The cases were decided February 23, 1888, and the several defendant rail lines pretended to acquiesce in the verdict by simply changing their mode of rating.

"The following outrageous and most extraordinary of freight discriminations, exclusively in favor of the Standard Oil Trust, was proved by me and existed at least up to April 1, 1888, that we know of, and from my subsequent complaints and proofs it is exceedingly doubtful if the decision of the commission had any appreciable effect on the railroads."

Now, I have put in exhibits which show discrimination to the extent of 333 per cent. There is a lot of them, and I just merely mention that fact; the exhibits show that the highest discrimination was 333 per cent.

LOUISVILLE AND NASHVILLE RAILROAD COMPANY.

	Mills per gallon charged Standard Oil Trust	Mills per gallon charged George Rice	Per cent discrimination
Louisville to—			
Nashville, Tenn.	7	15	114
Chattanooga, Tenn.	9.9	19.4	87
Memphis, Tenn.	5.7	12	110
Atlanta, Ga.	15.8	36.8	132
Selma, Ala.	15.1	36.5	141
Montgomery, Ala.	13.6	36.5	168
Mobile, Ala.	14.4	24	66⅔
Columbus, Ga.	17.7	40.9	131
Augusta, Ga.	16.2	35.1	116
Pensacola, Fla.	13.5	24	76
Cincinnati to—			
Birmingham, Ala.	10.9	47.2	333

CINCINNATI, NEW ORLEANS AND TEXAS PACIFIC (CINCINNATI SOUTHERN).

Cincinnati to—			
Lexington, Ky.	4.9	8	63
Chattanooga, Tenn.	10.1	26.4	161
Knoxville, Tenn.	9.6	26.4	175
Birmingham, Ala.	10.7	37.6	251
Meridian, Miss.	12.1	44.8	267
Vicksburg, Miss.	11.1	31.2	181
Shreveport, La.	17.3	53.6	209
New Orleans, La.	11.8	31.2	164
Atlanta, Ga.	11.7	36.8	214
Macon, Ga.	12.1	36.8	204

NEWPORT NEWS AND MISSISSIPPI VALLEY COMPANY. (Formerly C., O. & S. W.)

Louisville to—			
Memphis, Tenn.	4.4	9	100
New Orleans, La.	9.7	15	54
Vicksburg, Miss.	10.7	15	40

ST. LOUIS, IRON MOUNTAIN AND SOUTHERN.

St. Louis to—			
Houston, Tex.	15	53.6	257
Galveston, Tex.	15	53.6	257
Little Rock, Ark.	10	18.2	82
Newport, Ark.	10	18.2	82

"The above gross freight discriminations continued for at least one year of the interstate commerce act, regardless of the penalty of $5,000 fine and two years in the penitentiary for each and every offense.

"On May 8, 1888, the Missouri Pacific Railroad, regardless of this decision, were still carrying tank cars by the lump sum. This same road (1888) in the State of Arkansas were carrying petroleum in iron barrels for the Standard Oil Trust at 284 per cent discrimination in their favor.

"In 1889 I made several general complaints to the commission of general violations of the interstate commerce act by the Southwestern lines of railroads, reaching to the Pacific coast, of which the Cincinnati, Washington and Baltimore Railroad Company was the initial line out of Marietta, where my oil refinery was located, and at my request the commission issued notices to 151 contiguous lines as parties thereto to appear and be heard if they so desired. The substance of these complaints was embodied in these notices, as follows:

"It appearing to the commission in the above cases that in addition to the question of reasonableness of rates, the following other questions are also raised, namely:

"'1. The question of the like classification of barrel and tank oils, and of the right of the railroad companies to charge for the weight of the barrel package in addition to the weight of the contents.

"'2. The question of discrimination arising from the returning of empty tank cars free of charge, and also of the paying a mileage rate on empty tank cars.

"'3. The question of whether railroad companies are not obliged to furnish tank cars as well as cars of other description for oil transportation.

"'4. The question of the proper classification of cotton seed oil and turpentine as compared with petroleum and its products.

"'5. The question of discrimination in favor of petroleum and its products when carried in tank cars, resulting in giving a low rate on cotton seed oil or turpentine, or either, when carried as back loading in such tank cars.

"'6. The question of the duty of railroad companies to furnish shippers with tank cars in cases where the traffic of their lines can profitably or properly be carried in such tank cars and is large enough to justify the expenditure.

"'Long and short haul.'

"The four separate cases were tried together in December, 1889, and thoroughly done by that astute and experienced lawyer in railroad matters, Franklin B. Gowen, for many years the president of the Philadelphia and Reading Railroad Company. The cases were duly argued, and a partial but insignificant decision rendered, but not until two years had elapsed, when the commissioners decided that 'All the cases are held open for additional evidence,' which so thoroughly disgusted me after having spent so much time and money thereon, that I then determined to proceed no further, and abandoned the apparently hopeless pursuit of combined and confederated iniquity, and resolved to have nothing further to do with any future proceedings before the Interstate Commerce Commission.

"I fully and clearly proved the following facts:

"That the Trans-Continental Association, composed of 21 lines of road, had advanced freight rates in 1889 over 1887, when my first complaints were brought, to the extent of 83 per cent, which was unreasonable. Also proved that these lines carried cotton seed oil, worth four times as much as petroleum, at 26 cents less per 100 pounds. That the Trans-Missouri Freight Association charged 25 cents per 100 pounds more for carrying petroleum than cotton seed oil.

"That the Southern Railway and Steamship Association, of which the Louisville and Nashville Railroad Company was a member, advanced freight rates in 1889 over 1887 from 10 to 121 per cent, which was clearly unreasonable. Also proved that the Chicago, Rock Island and Pacific Railroad charged 25 cents more per 100 pounds for carrying petroleum than cotton seed oil.

UP TO MARCH 15, 1892, THE STANDARD OIL TRUST GOT 1¼ PER CENT OF ITS SHIPMENTS CARRIED FREE BY A REBATE REDUCTION OF 62 GALLONS ON EACH TANK CAR.

"I also proved that the Standard Oil Trust had an exclusive secret rebate reduction on quantity shipped, in place of money rebate, of 62 gallons deduction on each and every tank, or 1¼ per cent of its shipments carried free."

No one else got that at all; no one else got that rebate or reduction.

Q. Is that supposed to be on tank cars as compared with barrel shipments? Is that the reason that they themselves gave? A. I think the only reason I heard for it was for wind in the dome of the car, or something of that kind. There was no good valid reason for it.

Q. The question is this, what reason did they pretend that there was for it? A. I do not know. I never knew what their pretended reason was; there was no good reason.

Q. When this matter was brought to their attention, both the Standard Oil Company and the railroad company presumably assigned some reason for it? A. I do not know what they did assign, probably leakage or something or other. There was no sense in it, anyhow.

(Reading:) "This continued until March 15, 1890, when it was changed to 42 gallons reduction, and continued to September 1, 1892.

"Also proved that shippers of oil in barrels should be charged only for the oil shipped, and not for the barrel, to offset the return of empty tank cars that can't bring back other freight (except in extreme cases), while a box car can. Besides a tank car weighs 3,500 pounds more than a box car of same capacity."

Why, up to 1888 the Pennsylvania Railroad carried oil in barrels, including the package, for the

same rate as so many gallons in a tank car; and about a year after the interstate commerce act took effect they changed it so that the independent shipper would have to pay for the weight of the package.

Q. (By Mr. Ratchford.) What reason do you assign for the change in the rate on shipments in tank cars as compared with the rate for barrels? A. I think it was done at the instigation of the Standard Oil Trust.

Q. Did the Standard Oil Trust at the time of the change have control of all the tank cars? A. Principally. Almost absolutely.

. Principally? A. Of course there were more or less outside refiners that had a moderate amount of cars, but not very many.

Q. Then you believe that the railroad rate of shipment in tank cars is not due to the advantage that results to the company from the transportation of oil in tank cars, but rather is a favor for those who control the tank cars? A. Yes.

TANK CARS NOT AN ADVANTAGE TO THE RAILROADS,

Q. (By Mr. Farquhar.) But is not the tank car really an advantage in handling the oil? A. To whom?

Q. To the railroad companies, an advantage to all that handle oil? No, sir. I have got the very best evidence from the Pennsylvania Railroad, if you will let me read this.

(Reading:) "John S. Wilson, general freight agent of the Pennsylvania Railroad Company (the highest authority we have), testifies before the Interstate Commerce Commission on January 3, 1888, that he would rather carry powder than oil in tank cars, and that the shipment in barrels is preferable. Hear him:

"'I think, altogether, it is the most undesirable business we do, the carriage of oil in tank cars. There is no stopping it when once it starts. We had a smash up at New Brunswick. We came in collision there with a line of tank cars, the oil got on fire, and I think it ran two squares, got into a sewer, ran burning a square or two more, ran on the canal, which was then frozen over, followed the ice a square or two beyond, and besides our own direct losses, we have already paid nearly $500,000 for the destruction there. I regard it as worse that powder to carry. The bridge at New Brunswick was burned down, which cost us $200,000 or $300,000, besides nearly $500,000 paid out for outside destruction.

"'We might run for ten years and by good luck and have no serious accident. Whereas, on the other hand, we might strike another case like that at New Brunswick and lose more money than we could make on carrying oil for ten years. I would rather carry anything else than oil in tanks.

"'The movement in barrels I have always considered preferable for two reasons. First, we load barrels in a car that will carry a return cargo. There are no back loads for a tank car. For stock and box cars we can load back and get an increased earning for the round trip. Secondly, if there comes a collision or fire, the packages being separate we are enabled to save some of the tonnage. There is no hope of saving the contents of a tank car if it once gets on fire. Barrels you can sometimes scatter and roll off and break them up.'"

This gentleman did not stay long with this railroad company after that evidence was given.

Q. (By Mr. Farquhar.) Well, independent of this gentleman's opinion on that, the railroads have adopted the tank car instead of the barrel for the shippers? A. Yes; and principally under the control of the Standard Oil Trust.

Q. And independent also of the barrel transportation, the railroads put tanks in the sixth-class classification and barrels in the fifth class. How do you account for that as a practical business proposition? A. I think that tariff was made by the Standard Oil Trust. I think they make up the petroleum tariffs in the United States. They make up the oil tariffs at 26 Broadway and give them out to the railroads to carry it as they say, or else they do not get any freight.

Q (By Mr. Ratchford.) Is not there an advantage in carrying and loading and unloading tank cars as compared with the barrels? A. Yes; if your cars arrive at a point where you could gravitate it out, or if you had a short hose attached to them—a short hose into which you could put a pump, you could suck it out; and of course, a tank car carries more oil and saves the weight of the barrel; they carry a larger weight.

Q. In every case it is either taken out by gravity or pumped out? A. Yes.

Q. (By Mr. Farquhar.) In nearly all cases it is gravity, is it not? A. I do not know about that, either. At the refinery at Bayonne, owned by the Columbia Oil Company, I think they take all the oil out by pump; I am quite sure they do; their works, I know, are right down on almost level ground and they could not take it out by gravity.

Q. By Mr. Ratchford.) Do the railroad companies load the oil, or the producer? A. The producer.

Q. And the railroad or shipping company unloads it? A. The receiver of the oil unloads it, and the producer or owner of the oil loads it; so that the road has nothing to do with it. It is the same with barreled oil. The refinery loads its barrels into the car and the road has nothing to do with it; and so with unloading. There is no difference in that respect.

(Reading:) "I proved that the intermediate rate on petroleum, via the trans-continental lines, in 1889 was $1.90 per 100 pounds. The wooden-barrel shipper was required to pay on 85 pounds additional weight, which would amount to $1.61 per barrel more, in gross violation of sections and 4 of the act. The average market price of crude oil in 1889 was 94 cents.

"I proved that there was a charge of $95 per tank car by the trans-continental lines, to return empties from Pacific coast to Missouri river."

This is all since the interstate commerce act went into effect.

(Reading:) "Thomas M. Kimball, general traffic

manager of the Union Pacific, testified, June 22, 1887, before the Pacific Railway Commission, that his road carried the empty tank cars of the Standard Oil Company free, same as the other roads.

"'Q. What was the rate allowed to the Standard Oil Company? A. All sorts of rates, according to point of delivery, and the liveliness of competition at that point; 5 per cent, 10 per cent, 15 per cent, and up to 30 per cent.'

"So this great line, and a Government road, enters the arena to assist the Standard Oil Trust to throttle competition as against the rights of the people who have built the road.

"'I proved that refined oils in bulk were being carried at 6 per cent less than actual weight, or 6 per cent of refined oil carried free for the Standard Oil Trust. Their various lubricants, residum, etc., carried at 10 to 15 per cent less weight, according to gravity."

DISCRIMINATION BY EXCLUSIVE "STOP-OVER" PRIVILEGES.

"I also proved that the several associated lines of railway constitutin the Southern Railway and Steamship Association pool, the Southwestern Traffic Association pool, and the Trans-Cantinental Association pool were grossly violating the third and fourth sections of the act, long and short haul, to the extent of 56 to 225 per cent, which inured to this extent, in favor of the Standard Oil Trust, by prepayment of its freight at the low car lot, terminal rate, with privilege of stop all such cars at high rate intermediate points.

"I paid out over $1,200 in subpoenas in those cases by an imperative rule adopted by the commission, which was not required in my first cases.

"It is fair to assume, because of failure of the commission to properly decide these cases, that the same discriminations not only have continued, but they have even gotten worse, for, on May 2, 1890, the St. Louis, Arkansas and Texas Railway (applicable to all southwestern lines) issued a special oil tariff sheet for exclusive benefit of the Standard Oil Trust"—

That I know, and I could not get it.

(Reading:) "By which this trust could stop off full loaded tank cars at high-rate intermediate points and divide same up into less than car lots, to be distributed at several stations, by canning same, which should have paid three times the terminal rate. This was an exclusive tank car tariff sheet, not applicable to barreled oil in box cars, for the independent refiner who could afford to purchase rolling stock tank cars.

"Per letter of the commission, July 12, 1897, these special and most extraordinary of freight discriminations yet continue, and are exclusively in favor of the Standard Oil Trust on petroleum shipments.

"'As to what lines allow stop-over privileges, it is understood that all the lines named on the Southwestern Traffic Association tariffs as parties thereto participate in the stop-over privilege provided therein'"

That is a quotation from the Interstate Commerce Commission.

TANK CAR DISCRIMINATION.

(Reading:) "The tank car has been the greatest medium for the Standard Oil Trust to receive rebates by carloads being carried at a lump sum rate regardless of weight, inconceiveably low as compared to tariff rates by the 100 pounds.

"The railroads won't furnish tank cars, and if an independent refiner is able to buy a few, thus decreasing his working capital, he is confronted by these present special railroad instructions inserted in the tariff sheets."

To show you how the railroads put every possible obstacle in the way to freeze out and keep out competitors, this is what they put in. (Reading:) "The 'Southwestern Bureau,' of which the Missouri, Kansas and Texas Pacific is a member, owned by the Standard Oil Trust officials, has this to say at the present time: 'Oil tanks.—Carload, petroleum storage tanks for petroleum and its products, intended for permanent oil stations——"

Intended for permanent oil stations, mind you, gentlemen.

(Reading) "'Shall be transported at actual weight at the oil rate, when filled with oil that pays the bureau line's oil rate.'"

That is as much as to say that the railroads have a right to say whether a station that I might put up is going to be a permanent one. But if I wanted to put up one it would be practically impossible to get the right of way or a place to put it up, for I was two years waiting and trying to get that; or if you did get it and you put your plant up, it was in the discretion of the railroad to say whether that was going to be a permanent thing. Anybody would know that it would not be permanent because you can't live. The railroad would discriminate and you could not survive. It would not be any good whatever. I have another one right here.

(Reading:) "Central Freight Association.—Tank gauge handbook No. 4 says, applicable to all roads in the United States at the present time: 'Petroleum and its products in tank cars will be delivered only when consigned to parties at points at which they have proper unloading and storage facilities, and when shipments in tank cars are sent to parties who have not such facilities the shipments will be returned to shippers at their risk and expense.'"

Just think of it! It is all left with the railroad to say whether you can have any show or not, and they do not give you any show and don't propose to do it, either.

(Reading:) "On May 6, 1891, the Southern Pacific Company issued an exclusive special oil tariff"——

Here is something very important.

(Reading:) "With these exclusive advantages in favor of the Standard Oil Trust, being the exclusive owner of a peculiar box tank car combination, patented, of two upright iron tanks set inside a box car that thus avoids paying $105 a tank car for return of empty cylinders from Pacific coast to

Missouri river. This special oil tariff, governing all trans-continental lines, allowed this trust 27 cents per 100 pounds lower rates for petroleum transported in these special patent cars, as against the regular rates. This is discriminatory against the independent tank and barrel shipper by $105 a tank car, and $1.08 per barrel when shipped in barrels.

"The present highest intermediate rate on petroleum in less than car lots, Chicago to Pacific coast over trans-continental lines, is $2.70 per 100 pounds, or $10.80 per barrel of 400 pounds to the independent barrel shipper, while the Standard Oil Trust, by prepayment of its freight at the car terminal rate of 78½ cents per 100 pounds on 320 pounds, or $2.51 per barrel, gets an advantage of 330 per cent over its competitors in freight discrimination."

TEMPORARY REDUCTIONS FOR THE PROFIT OF THE STANDARD.

"Another method of freight discrimination in favor of the Standard Oil Trust on the trans-continental lines, per tariff of 1888, was to reduce rates temporarily one-half and then raise them again 50 per cent, so the trust, on exclusive secret information, could stock up on the low prices, while its competitors always had to pay the high tariff rates."

Now, I will just read some telegrams that passed between Mr. Stubbs, of the Southern Pacific, in which he agrees to allow the Standard Oil Trust to stock up with petroleum products at low prices. This is here to show how it is done all at the pleasure of the Standard. This is from the Paint, Oil, and Drug Review of January 25, 1893, and I know all about it, because one of the men that is interested came to see me about it and showed me some of these telegrams.

[From the Paint, Oil and Drug Review, January 25, 1893.]

HOW IT IS DONE—ALL AT THE PLEASURE OF THE STANDARD.

How completely the Standard Oil Company has its grip on the railroads is best evidenced by producing copies of telegrams that passed between the freight agents of the transcontinental lines, the Standard Oil Company at San Francisco, and the Standard Oil Trust at New York. How, at the pleasure of the unscrupulous monopoly, it was enabled to stock up during low freight, and an interesting game of seesaw was played on weak competitors. In all cases freights were to be advanced and lowered upon notice from the Standard. A baser trade conspiracy never went into print. It follows:

[Copy of Telegram.]

San Francisco, November 14, 1888.

J. C. STUBBS,

General Traffic Manager Southern Pacific Company, St. Louis:

Tilford says regarding raising and lowering oil rates during the year, as talked before leaving, he thinks it better if you could, without giving particulars to Transcontinental Association lines, get consent to leave oil rates in hands of committee without explaining exactly why, but if your judgment approves you might give full particulars to two or three longest lines.

W. SPROULE,
Asst. Genl. Frt. Agt. Southern Pac. Co.

[Copy of Telegram.]

San Francisco, November 14, 1888.

W. SPROULE, *San Francisco*:

Say to Tilford that association will probably consent to following agreement: Oil rate from Cleveland to be $1; at this rate he can stock up; after doing so he to notify Chairman Leeds, who, after giving necessary notice, will advance rate to $1.25, and continue that rate until such time as Tilford notifies him of reduced stock ,when he will again reduce it to $1 to enable him to stock up. J. C. STUBBS.

[Copy of Telegram.]

San Francisco, November 15, 1888.

J. C. STUBBS, *St. Louis*:

Tilford received your message, and in reply says he can not afford to pay $1—that is too much, owing to water competition—but will agree to pay for petroleum and its products 85 cents from Cleveland, and if roads hard up might possibly raise the rate to 87½ cents. Tilford says this offer of his is provided association will agree to advance rate to $1.25, and reduce it from time to time as he may desire, as outlined in your message of yesterday. Please answer. Tilford says please do not advance present linseed or lead rates, as it would interfere with negotiations that he has now under way with Whittier, Fuller & Co.

W. SPROULE.

[Translation of message to W. A. Bissell, general freight agent Atlantic and Pacific Railroad.]

San Francisco, November 15, 1888.

W. A. BISSELL, *St. Louis:*

Tilford's proposition to the association through Stubbs is that he will pay 85 cents on petroleum and its products from Cleveland; possibly, if roads hard up, he might increase this to 87½, provided association advance freight to $1.25 when he gives notice. He would stock up at low rate, then notify the association when to advance, the advance or decline to be made at certain seasons of the year in accordance with his supply on hand. Do not let Stubbs know of this telegram. W. SPROULE.

[Copy of Telegram.]

St. Louis, November 16, 1888.

W. SPROULE, *San Francisco*:

All rates will be advanced. Would advise that he accept proposition, otherwise sure rate will be made $1 without any conditions; clipper competition will be cared for. J. C. STUBBS.

[Copy of Telegram.]

San Francisco, November 19, 1888.

W. H. TILFORD,

Trustee Standard Oil Trust, 26 Broadway, New York:

J. C. Stubbs telegraphs as follows under date of 14th instant: "Transcontinental Association will probably consent following arrangement: Oil rate from Cleveland to be $1; at that rate Standard Oil Company, San Francisco, can stock up. After doing so Standard Oil Company can notify Chairman Leeds, who, after giving necessary notice, will advance freight rate $1.25 and continue that rate until such time as Standard Oil Company notifies him of reduced stocks. I telegraphed J. C. Stubbs as follows: "Can not afford to pay $1; that is too much, owing to water competition, but will agree to pay for petroleum and its products 87½ cents, provided Transcontinental Association will agree to advance rate to $1.25 and reduce it from time to time as outlined in Stubb's message; adding request of Transcontinental Association not to advance linseed or lead rates." Under date of 6th instant, J. C. Stubbs telegraphs as follows: "All rates will be advanced. Would advise that Standard Oil Company accept proposition; otherwise sure rate will be made $1 without any conditions. Clipper competition will be taken care of." What do you advise me to say to him? Advise me by wire at once.

E. A. TILFORD,
President Standard Oil Company of Iowa.

[Copy.]

San Francisco, November 20, 1888.

J. C. STUBBS,

Care Southern Hotel, St. Louis:

Your telegram, 16th, through Sproule, received. I will raise my offer to 90 cents for petroleum and its products from Cleveland, association agreeing to conditions stated in your telegram to Sproule, 14th. This is the highest we have ever paid. This rate I believe would be a permanent thing and not stimulate clipper shipments or private clipper charters; therefore in long run would prove mutually more beneficial than $1. Will you advocate 90 cents? I think with your vote for this rate, and you personally putting it before association, it would go through. We will have to ship quite a number of cars during high rate owing to special orders coming in. This should be taken into consideration when I ask that 90 cents be adopted. Please answer. E. A. TILFORD.

[Copy of Telegram.]

San Francisco, November 21, 1888.

W. H. TILFORD,

26 Broadway, New York:

Dispatches received. Since telegraphing you yesterday, I received telegram from A. T. and S. F. R. R., St. Louis, intimating that Transcontinental Association would accept something less than $1 from us. Therefore, I will telegraph J. C. Stubbs, care Southern Hotel, St. Louis, as follows: "I will raise my offer to 90 cents on petroleum and its products from Cleveland, Transcontinental Association agreeing on conditions stated in his telegram, 14th. This is highest rate we ever paid. This rate, I believe, would be permanent thing and would not encourage heavy clipper shipments; therefore in long run would prove mutually more beneficial than $1. Will you advocate 90 cents? I think with your vote for this rate and you personally putting it before association it would go through. We will have to ship quite a number of cars during high rate, owing to special orders coming in from points where we have no warehouses. This should be taken into consideration when I ask that 90 cents be adopted." I request J. C. Stubbs please answer. I do not know whether my telegram reached J. C. Stubbs. owing to his being in New York city. When you see J. C. Stubbs, say I telegraphed him as above, care Southern Hotel, St. Louis. In your talk advocate 90 cents as outlined above. Do not intimate to Stubbs that I have received any result from A. T. and S. F. R. R. people, St. Louis. Telegraph me the result of your interview with Stubbs. Pay charges on Union Tank Line patent car referred to and send expense bill to me. E. A. TILFORD.

[Copy—Subject: New T. C. A. rates.]

STANDARD OIL COMPANY,

San Francisco, November 21, 1888.

W. H. TILFORD, *26 Broadway, New York:*

After telegraphing you yesterday afternoon saying that I would telegraph J. C. Stubbs as outlined in your message of yesterday, I received word, through A. T. & S. F. office here, from W. A. Bissell, general freight agent of the Atlantic and Pacific Railroad, who is now in St. Louis, that he thought the association would accept something less than $1 from us if our offer was properly put before them, consequently I telegraphed J. C. Stubbs, as per my translated copy of message to you herewith attached. I was not aware that Mr. Stubbs was in New York and sent my message to the Southern Hotel, St. Louis; therefore I requested in my message to you that when you meet Mr. Stubbs you say that I telegraphed him, care Southern Hotel, St. Louis, and also outline to him the substance of my message, incorporating further along in my telegram that in your interview with Mr. S., please advocate the 90 cent rate.

I will advise you as soon as I hear definitely when the new rates of freight that the Transcontinental Association are agreeing on now will take effect. I heard today, through A. T. & S. F. office here, that Mr. Bissell had telegraphed from St. Louis that he thought the new traffic would go into effect on or about the 15th or 20th of next month. Please treat this confidentially, but, as I state before, as soon as I find out definitely regarding the new rates I will duly advise you. E. A. TILFORD.

[Copy.]

New York, November 23, 1888.

E. A. TILFORD, *San Francisco*:

General meeting adjourned to meet at Chicago, Monday morning. Will take up matter then. Will do best I can. Probably can make it 95, which your brother Hunt says you can stand. If you have to address me, care Pacific Hotel, Chicago.

J. C. STUBBS.

[Copy.—Subject: Rates on oil from Cleveland to the Pacific coast.]

STANDARD OIL COMPANY,

San Francisco, November 23, 1888.

W. H. TILFORD, ESQ., *26 Broadway, New York*:

Dear Sir: I beg herewith to hand you copy of my translated dispatch to you of even date, which explains itself.

From Mr. Stubbs' dispatch you will see that he seems to think that you have already agreed that I will stand 95 cents on oil from Cleveland to the Pacific coast. In your dispatch to me a few days ago you stated you talked with Mr. Stubbs about 90-cent rate, suggesting, however, further along in your message that Mr. Stubbs should telegraph that he could get the 95-cent rate adopted, that I had better accept the same. From your message I would imagine that you simply talked the 90-cent rate, without committing yourself to Mr. Stubbs about a 95; hence my reason for asking you the question as to whether you had agreed to the 95, in my message of today.

Yours truly,

E. A. TILFORD.

[Copy.—Subject: Error in translation of message.]

STANDARD OIL COMPANY,

San Francisco, November 24, 1888.

W. H. TILFORD, ESQ.,

Vice President Standard Oil Company, 26 Broadway, New York:

Dear Sir: I am just in receipt of your message of even date saying that you translated my message wrong, reading the rate that I had offered the transcontinental lines 95 cents, instead of 90 cents.

I think whoever translated my message in your office should be disciplined, for the error will prove, I am afraid, quite expensive to us here. I am afraid now the damage is done and I will be unable to secure a lower rate than 95 with the Transcontinental Association lines. I am fully convinced, however, if you had talked 90 cents to Mr. Stubbs when you saw him I could have had this rate put in effect. I will, however, as you suggest, telegraph Mr. Stubbs tonight, care Grand Pacific Hotel, stating that when you mentioned 95 cents to him, that the same was based on an error in translating my cipher message, and that I still hope he will advocate the 90-cent rate.

Yours truly,

E. A. TILFORD.

[Copy of Telegram.]

Chicago, November 26, 1888.

E. A. TILFORD, *San Francisco*:

I told Hunt your dispatch to me read 90, and he must be in error. He afterwards confirmed my view, and at the same time expressed himself as willing to compromise on 95.

J. C. STUBBS.

[Copy.—Subject: Oil rate.]

[Personal.]

W. H. TILFORD, ESQ.,

Vice President Standard Oil Company, 26 Broadway, New York:

Dear Sir: I am just in receipt of the following message from Mr. Stubbs:

"Chicago, November 26, 1888.

"E. A. Tilford, San Francisco:

"I told Hunt your dispatch to me read 90, and he must be in error. He afterwards confirmed my view; at the same time expressed himself as willing to compromise on 95."

I telegraphed Mr. Stubbs as I wrote you I would on the 24th instant, and the above message from him is in reply to my telegram. Mr. Stubbs' statement as to you agreeing to compromise on 95 cents does not exactly tally with what you wired me under date of the 24th instant. (Please see your telegram of that date.) Will you please write me (for curiosity sake) what are the facts as to your interview with J. C. S. Of course I understand before my letter can reach you, and you can reply, the 90 or 95 cents rate will be selected; but as I would like to know for my own satisfaction, hence my requesting you to write me. I will make up some sort of message tonight to send to Mr. Stubbs in reply to his of above date, but, as I state in my letter of the 24th instant, I believe now that nothing will be accepted but 95 cents.

Yours truly,

E. A. TILFORD.

[Copy of Telegram.]

San Francisco, November 26, 1888.

J. C. STUBBS,

Care Grand Pacific Hotel, Chicago:

To quote Pinafore, Hunt evidently got those babies or rates mixed up. Lines had better give 90 a trial. If later on there's possibility advancing, you know I am always willing. Whittier has large lot clipper oil now arriving and it will be hard for us to meet this competition even if our rate made 90.

E. A. TILFORD.

[Copy.—Subject: Freight rates.]

STANDARD OIL COMPANY,

San Francisco, November 28, 1888.

[Personal.]

W. H. TILFORD, ESQ.,

26 Broadway, New York:

Dear Sir: I am just in receipt of your day message of even date, saying that Standard Oil Company,

Cleveland, and Standard Oil Company, Pittsburg, would probably fill all my orders by Saturday night, December 22, and that the new rate of $1.25 per 100 should go into effect 24th proximo, etc.; contents of the same carefully noted.

I have not heard anything this week form the transcontinental roads which are now holding forth at Chicago, as to when they will be ready with their new tariffs. I wrote you some few days ago that the Atchison, Topeka and Santa Fe people telegraphed me from St. Louis that they did not believe the new tariff would go into effect before the 15th proximo. It looks to me now as though this tariff would not be put into effect before December 20 to January 1, 1889. I am, however, in communication with the agents of the different lines, who are now at Chicago, and just as soon as I learn definitely as to date when the new tariffs will go into effect, I will promptly telegraph you. If I find out definitely that they will be ready with their tariffs before December 22, I will arrange to have the present rates remain until the 24th proximo, as you suggest. I wish, however, you would impress upon Standard Oil Company, Cleveland, and Standard Oil Company, Pittsburg, the necessity of filling out all our orders at an early date as possible.

Yours truly,

E. A. TILFORD.

[Copy.]

[Personal.]

OFFICE GENERAL FREIGHT AGENT,
SOUTHERN PACIFIC COMPANY,
San Francisco, December 3, 1888.

E. A. TILFORD,
President Standard Oil Company, City:

Dear Sir: I have advices from Chicago that arrangements for coal oil rates have been closed, and the new rates thereunder will probably go into effect January 1. From Cleveland and Pittsburg 90 cents per 100 pounds, and from New York $1 per 100 pounds. The basis of operation of these rates, looking to the conserving of your interests, is intended to be communicated in recent advices from Chicago, of which you are informed.

Yours truly,

WM. SPROULE.

[Copy of telegram.]

San Francisco, December 4, 1888.

W. H. TILFORD,
26 Broadway, New York:

J. C. Stubbs telegraphs as follows from Chicago: "Oil freight rates have been closed. New freight rates thereunder probably effective Jaunary 1. From Cleveland and Pittsburg 90, from New York $1." This message from J. C. Stubbs means 90 for us to stock up with, with $1.25 in effect whenever we want. See my letter of this date.

E. A. TILFORD.

[Copy.—Subject: Freight rates.]

[Personal.]

STANDARD OIL COMPANY,
San Francisco, December 4, 1888.

W. H. TILFORD, ESQ.,
Vice President Standard Oil Company, 26 Broadway, New York:

Dear Sir: I will telegraph you this afternoon as per translated copy of message herewith attached, which is self-explanatory.

I herewith hand you a copy of a letter I have just received from Mr. Sproule, assistant general freight agent of the Southern Pacific Company, this city. This letter I interpret to mean the 90-cent rate is for us to stock up from time to time, and that the $1.25 per 100 rate will be in effect whenever we may desire. This $1.25 rate is what Mr. Sproule refers to in the latter portion of his letter, as my offer of 90 cents to Mr. Stubbs was on condition that he has the rate of $1.25 put into effect when we might ask him. This letter also reads as if the 90-cent rate and $1 rate was to be put in effect January 1. No doubt Mr, Stubbs was unaware that we were stocked up at the present rate of 82½.

The Transcontinental Association adjourned at Chicago yesterday, and I understand that Mr. Stubbs is now on his way home. I will see him on his arrival here, and if Chairman Leeds, of the Transcontinental Association, has been notified to put the 90-cent rate in effect January 1, I will have the same corrected by wire and the $1.25 rate put in. As soon as Mr. Stubbs reaches home I will telegraph you whether it is intended that the 90-cent rate should be put in effect January 1 or the $1.25.

Yours truly,

E. A. TILFORD.

(Inclosed 2.)

[Copy.—Subject: Transcontinental Association freight rates from Chicago. U. P. cut to Denver.]

[Personal.]

STANDARD OIL COMPANY,
San Francisco, December 5, 1888.

W. H. TILFORD, ESQ.,
Vice President Standard Oil Company, 26 Broadway, New York:

Dear Sir: I am just in receipt of your two dispatches of yesterday bearing on the subject at the head of this letter—contents of the same carefully noted. I herewith hand you translated copy of my reply, which is self-explanatory. I hardly think the newspaper reports that the Transcontinental Association will allow differentials in favor of Chicago to such an extent that the local rate from Lima and the oil regions to Chicago, added to the rate from that point, would be less than the through rate from Cleveland to the Pacific coast on petroleum and its products.

My telegram and letters to you of yesterday in which I enclose you a copy of the letter from Mr.

William Sproule, assistant general freight agent of the Southern Pacific Company, of this city, giving the substance of the telegram that he had received from Mr. Stubbs at Chicago, names the rates on petroleum from Cleveland, Pittsburg, and New York.

I expect (without knowing) that the rates from the oil regions and Lima will be the same as from Cleveland and Pittsburg to the Pacific coast. Just as soon as I see Mr. Stubbs I will advise you what other points —other than Cleveland and Pittsburg—the 90-cent rate will apply. If there is any truth in the newspaper report which you refer to, about the local rate added to the Chicago making a less rate than the through, I will have the same duly corrected without delay and promptly notify you.

I will not telegraph the Union Pacific people regarding the cut rate into Denver, as your second dispatch states the rates will be restored on Saturday night next.

Yours truly,

E. A. TILFORD.

[Copy of telegram sent to J. C. Stubbs through Sproule.]

San Francisco, December 6, 1888.

J. C. STUBBS, *Chicago*:

If it is not already agreed upon that the $1.25 rate is to go into effect January 1, on petroleum and its products from Cleveland and Pittsburg to the Pacific coast, will you kindly telegraph Chairman Leeds to put this rate in effect on the day mentioned. Please answer. E. A. TILFORD.

[Copy of telegram.]

San Francisco, December 6, 1888.

W. H. TILFORD,

26 Broadway, New York:

J. C. Stubbs reaches Windsor Hotel, New York, tomorrow morning. I have telegraphed him, if it is not already agreed upon, to arrange to have $1.25 rate put in effect January 1, requesting answer. I telegraphed this to J. C. Stubbs fearing might be some misunderstanding and 90-cent rate put in. Dispatch received. I have telegraphed Union Pacific Railway.

E. A. TILFORD.

[Copy.—Subject: Freight rate.]

[Personal.]

STANDARD OIL COMPANY,

San Francisco, December 6, 1888.

W. H. TILFORD, ESQ.,

Vice President Standard Oil Company, 26 Broadway, New York:

Dear Sir: I will telegraph you this afternoon as per translated copy of my message herewith attached. I telegraphed Mr. Stubbs today through his office here (Southern Pacific Company) as follows: "If it is not already agreed upon that the $1.25 rate is to go into effect on January 1 on petroleum and its products from Cleveland and Pittsburg to Pacific coast, will you kindly telegraph Chairman Leeds to put this rate into effect on the date mentioned. Please answer." I wrote you on the 4th instant, subject, "Freight rates," giving particulars as to the freight situation up to that date. Kindly see my letter of above date. I was a little bit fearful there might be some misunderstanding and the 90-cent rate put into effect January 1 instead of the $1.25; hence my reason for telegraphing Mr. Stubbs today, as outlined above. When I wrote you on the 4th instant I was under the impression that Mr. Stubbs was on his way to San Francisco, but today I learn that he will reach New York tomorrow. I will duly advise you of the reply I receive from Mr. Stubbs in answer to my today's telegram. My reason for telegraphing you Mr. Stubbs is in New York was thinking possibly that you might wish to see him and discuss our freight situation, and in order to have you do so intelligently I desire to keep you posted as to what was passed between Mr. Stubbs and myself by telegraph. Up to date I have repeated to you in substance everything that has passed between Mr. Stubbs and myself since the Transcontinental Association has had their last meeting east.

E. A. TILFORD.

[Copy.]

[Personal.]

SOUTHERN PACIFIC COMPANY,

OFFICE OF THE GENERAL FREIGHT AGENT,

San Francisco, December 8, 1888.

MR. E. A. TILFORD,

President Standard Oil Company, City:

Dear Sir: I beg to inform you that I am in receipt of advice that on January 1 the rate on petroleum oil and its products will be to $1.25 per 100 pounds on carload shipments from agreed eastern points.

Yours truly,

WM. SPROULE.

[Copy of telegram.]

W. H. TILFORD,

26 Broadway, New York:

J. C. Stubbs telegraphs me that oil rate will be $1.25 January 1. E. A. TILFORD.

[Copy.]

[Personal.] STANDARD OIL COMPANY.

San Francisco, December 8, 1888.

W. H. TILFORD, Esq.,

Vice President Standard Oil Company,
26 Broadway, New York.

Dear Sir: I will telegraph you this afternoon as per translated copy if by message herewith attached, which is self-explanatory.

I wrote you on the 6th instant, subject, "Freight rate." In my letter of above date I give you verbatim my telegram that I sent to Mr. Stubbs in New York. I herewith hand you copy of a letter that I have re-

ceived from Mr. William Sproule, assistant general freight agent Southern Pacific Railway Company, this city. This letter of Mr. Sproule's is quoting in substance a telegram from Mr. Stubbs in answer to my message to him of the 6th instant.

I think we have managed this freight business pretty well from this long distance, especially when you think that we have secured the 90 cents rate with which to stock upon from time to time, and after some misunderstanding as to a compromise,

Yours truly, E. A. TILFORD.

[Copy—Subject: Correspondence with Mr. Stubbs.]

[Personal.] STANDARD OIL COMPANY,

San Francisco, December 8, 1888.

W. H. TILFORD, Esq.,

Vice President Standard Oil Company,
26 Broadway, New York.

Dear Sir: In looking over my letters and telegrams to Mr. Stubbs regarding the petroleum and its products rate, also my correspondent to you on this subject, I find on the 27th ultimo I wrote you, subject, "oil rate" (please refer to this letter), wherein I quoted a dispatch that I had received from Mr. Stubbs. I also stated in this letter that I would make up some sort of message to send to Mr. Stubbs in answer to his from Chicago, November 26. I do not think that I sent you a copy of the message referred to, which telegram was as follows:

"NOVEMBER 26, 1888.

"J. C. STUBBS,

"Care Grand Pacific Hotel, Chicago.

"To quote Pinafore, Hunt evidently got those babies, or rates, mixed up. Lines had better give 90 a trial. If later on there's possibility advancing, you know I am always willing. Whittier has large lot Clipper oil and it will be hard for us to meet this competition even if our rate is made 90."

As this freight rate question is now settled, and I want you to know just exactly what has passed between Mr. Stubbs and myself, I believe with the above dispatch you now have the full data up to date on this subject.

Yours truly, E. A. TILFORD.

[Copy of Telegram.]

SAN FRANCISCO, *December* 11, 1888.

W. H. TILFORD, *26 Broadway, New York*:

Assistant general freight agent Union Pacific railway just arrived here. He says practically rates from Chicago 99 per cent of New York rate. This answers your telegram, 4th. Lead rate will be January 1, $1.06 from St. Louis; linseed 90 from Missouri river. We have stocks both sufficient to last next 4 months. . .

E. A. TILFORD.

This is since the interstate commerce act and shows that the roads allow the Standard Oil trust to stock up on low rates without the general public knowing anything about it.

Q. (By Mr. Phillips.) How do you explain that, in view of the letters that were read by Mr. Archbold before this commission stating that there had not been discriminating rates given since the interstate commerce law went into effect? A. I do not believe those letters at all. My experience with railroad men has been such that I have a very low opinion of them.

HOW WERE THESE TELEGRAMS OBTAINED?

Q. (By Mr. Jenks.) Do you know where this paper secured copies of these telegrams? A. This Mr. Bissell came to the interstate commerce commission and also corresponded with me. Mr. Bissell wanted me to go with him to prosecute this matter before the interstate commerce commission, and I would not be surprised if the interstate commerce commission had got copies of all these.

Q. But you do not know where the paper itself secured the copies? A. At Chicago; that is a Chicago paper.

Q. Where did they get copies of these telegrams? A. I think they got them from Bissell himself.

Q. Who is Mr. Bissell, and how did he get them? A. He is one of the officers of this railroad; W. A. Bissell, St. Louis. He was general freight agent of the Atlantic and Pacific railroad, one of the through lines. I think Bissell was discharged, and it strikes me he became an employe of the Standard Oil Company afterwards; that is my impression. I am not positive about that, but he was the man that exposed all this.

Q. Of course these telegrams are of a private character between officials of the Standard Oil Company, and it is quite singular that they should fall into the hands of Mr. Bissell. A. Mr. Bissell was discharged, either discharged from the railroad or the Standard Oil Company, or he left them; that is the way they got out.

Q. So you think there is no question at all as to the trustworthiness of these? A. No question, not at all; and I would not be surprised if the copies of these were with the interstate commerce commission, because I know he corresponded with them.

"COMMISSIONS" ON FREIGHT.

Now, they have got up a new phrase; that is, comparatively new; within five or ten years, maybe, but since the general rebate exposures came out. They have adopted the new phrase, "commission," a per cent off. The railroads say they can pay whatever commission they please; that is, they can pay 10, 25 or 50 per cent on a shipment, you know, and then go on the stand and say they are not paying rebates. They have adopted that name "commission" instead of rebate; a new order of things, that is all, to whip the devil around the stump.

Q. (By Senator Kyle.) Paying commissions for freight? A. Yes; for instance; if you are shipping $50,000 or $100,000 worth of goods in a certain length

of time they will take off 50 or 75 per cent instead of making a rebate.

Q. Paid as a bonus to get trade? A. Yes. Here is the point: These large shippers send an agent to a railroad and say to them, "Now, I think I can get that man's business, amounting to so much, provided you can pay him a certain commission." Well, "How much do you want?" That is finally arranged about the per cent; it is done through this intermediary, maybe, although I do not know that the Standard Oil trust has to do anything of that kind. I think they go direct to the headquarters of the road and make their own commission. Their own men are officers and trustees and fix all that easy enough.

Q. (By Mr. Clarke.) Have you any correspondence or documents of any kind to prove that use of the word "commission?" A. No; I do not know that I have. I have not any at hand here.

Q. How do you know, then, that is their present method? A. I know that from general information that I have had on the subject.

Q. (By Mr. Smyth.) Have you ever asked for a commission? A. No, sir.

Q. It has never been refused you? A. I have never asked for it, and of course it has never been refused.

Q. Do you suppose it would be refused? A. Why, certainly. They would say at once, we are not giving rebates, are not giving any discriminations or giving commission to anybody.

Q. Do you think that is done in other lines of business than the oil business? A. Oh, yes; only I think the discriminations in the oil business are much greater. I think that almost all these trusts and cobinations are formed upon these lines; and then they go to a railroad and say: "We have got so much freight to carry. What will you take it for? and if you do not want it we will give it to some other railroad." They will fix up a rate and say, "We will give you so much freight within a certain length of time." These large shippers figure all these things out. They know just what a road can take freight for and make a small margin.

Q. You have no proof of that? A. No; I have no proof of that.

Q. But you think it is so? A. I do. I should say with all these gross freight discriminations that I have exposed here they would do almost anything to accomplish their end, when it is right against the law. It is $5,000 fine and two years in the penitentiary for each and every offense of freight discrimination, but what does it amount to? It does not amount to anything. It doesn't deter any of these men from freight discrimination, not a bit.

Q. Do you mean us to understand that it is owing to the hostility of the Standard Oil Company to you personally that these commissions are not granted to you? Do you think they are granted in other lines of business? A. Oh, yes; certainly they are; and the letters of Receivers Cowen and Murray are the best evidence I know of. They themselves say and admit in that letter to the commission that they themselves are criminally violating the interstate commerce law, and after January, 1899, "we are going to observe tariff rates"; and they say further, "If we find any of our neighbors violating the law we will complain to you and we hope you will use your best efforts to compel them to come to time." They write a letter and admit that they are criminally violating the law, and they are the receivers of a railroad under protection of the United States court. My idea of it is that they thought that the other roads were giving a bigger commission and better rebates than they, and they were not getting their share, and they just thought they would come out and expose them.

Q. Your complaint is that they would not give you any? A. My complaint is against freight discrimination; that the small shipper can not do any business today because of rebates and freight discriminations. It is the greatest evil of the day and it is in gross voilation of the law. We have plenty of laws but they are not executed; one man stops the whole business. The Federal anti-trust act has all the elements in it to protect the people, but it is not enforced. It is not worth that [snapping his fingers].

THE ATTORNEY GENERAL SAID NOT TO ENFORCE THE LAW.

Q. (By Representative Livingston.) Please explain why the anti-trust act is not executed. A. Because the attorney general does not enforce it as he ought to enforce it.

Q. Can it not be enforced in the states independent of the attorney general? A. No. The act says that it must be done through the attorney general of the United States and his deputies. You know he has about 75 deputies under him. I will just read section 4:

"Sec. 4. The several circuit courts of the United States are hereby invested with jurisdiction to prevent and restrain violations of this act; and it shall be the duty of the several district attorneys of the United States, in their respective districts, under the direction of the attorney general, to institute proceedings in equity to prevent and restrain such violations. Such proceedings may be by way of petition setting forth the case and praying that such violation shall be enjoined or otherwise prohibited. When the parties complained of shall have been duly notified of such petition, the court shall proceed, as soon as may be, to the hearing of the case; and pending such petition and before final decree, the court may at any time make such temporary restraining order or prohibition as shall be deemed just in the premises."

Q. Has there been any effort made in your state to enforce that by any one of those solicitors? A. I do not know. I have had correspondence with the attorney general of the United States myself in regard to proceedings against the Standard Oil trust, but he doesn't act. I wrote him a year ago.

Q. Have you that correspondence? A. No; I haven't it with me; but that is the great trouble with the whole business. If this anti-trust act which was passed had been immediately enforced, I do not think there would have been this epidemic of trusts we have today, because they can enjoin and prohibit and confiscate their goods. I will just read that part of it:

"Sec. 6. Any property owned under any contract or by any combination or pursuant to any conspiracy (and being the subject thereof) mentioned in section 1 of this act, and being in the course of transportation from one state to another or to a foreign country, shall be forfeited to the United States and may be seized and condemned by like proceedings as those provided by law for the forfeiture, seizure and condemnation of property imported into the United States contrary to law."

They can enjoin. Suppose all these 75 attorneys were under orders from the attorney general of the United States to proceed against every one, it would make a great difference. But of course it would not amount to anything unless you get some of them in state prison—fines with them dont amount to anything.

Q. (By Mr. Jenks.) Do I understand you to say that in your correspondence with the attorney general, the attorney general decilned to enforce the law? A. He made excuses from one thing to another; that he hadn't the time to look into it, and the assistant attorney general had gone to Europe and hadn't got back.

Senator Kyle. I think it would be better to have a copy of the correspondence furnished, if you can furnish it, inasmuch as an implication has been made that he in a sense has put you off.

Q. (By Mr. Jenks.) Will you be kind enough to furnish the commission a copy of the correspondence with the attorney general? A. Yes, I can.

Mr. Jenks. If you please.

THE INTERSTATE COMMERCE COMMISSION DOES NOT DECIDE.

Q. (By Representative Livingston.) You said a while ago that discriminations on this trans-continental line were prevalent and constant. Have you made any effort with the interstate commerce commission to have that stopped? A. I have in a few of my own cases here. Eight or 10 years ago I made complaint—and the cases have all been held up and have been decided, partially decided—and they do not amount to anything. I have brought suits against the trans-continental lines, with notifications to 150 lines that they should appear and answer; and I proved all these gross freight discriminations, and I believe they are going on just as much today as ever.

Q. What does the interstate commerce commission say about it? A. They do not decide my cases; they do not decide this gross freight discrimination.

Q. Do they give you any reason why they do not decide them? Have you any correspondence here that will show that? Yes, here is the decision of this case.

Q. (By Mr. Phillips.) When was that decision rendered? A. April 9, 1892. They were brought in March, 1889, and April 26, 1889. They did not decide them until April, 1892, and then they only partially decided them, and left them all for additional evidence.

Q. (By Representative Livingston.) Additional evidence on which side? A. And of course it so disgusted me that I would not have anything more to do with it; I would not take any more evidence. I had spent a lot of money, and I had a first class lawyer, one of the finest in the United States, and a railroad man, to see to the cases, and proved all that I charged, and then they hung them up.

CONDITION OF INDEPENDENT REFINERS.

Q. (By Mr. Smyth.) You are a producer of oil as well as a refiner? A. No, I have not refined oil since May, 1896.

Q. Does this persecution on the part of the Standard Oil Company apply to your business as a producer of oil? A. No, I do not suppose it does, because I get the same price per barrel as anybody else.

Q. They buy your crude oil? A. Yes.

Q. It is only your business as a refiner? A. Yes.

Q. Have you been forced to discontinue your business of refining? A. Yes, I have been forced to discontinue refining owing to freight discrimination.

Q. And your refinery is idle? A. Yes, idle and rotting down. I have not run it since 1896. It is useless for anybody to try to build a new refinery against these odds. That would be suicidal. Even if I had $1,000,000 or $5,000,000, I would not "buck" against them.

Q. (By Representative Livingston.) Did they offer to buy your refinery? A. At one time we had some negotiations, but not latterly.

Q. Why did not you sell to them? A. Well, they did not want to pay me what I thought it was worth, and I did not sell to them.

Q. You either had to take what they offered or quit? A. Yes; and since that time they have been charging me as a blackmailer because I did not take what they thought it was worth.

Q. (By Mr. Smyth.) But there is no obstacle in your way as a producer of oil? A. No.

Q. (By Mr. Kennedy.) Are there any refineries in Ohio independent of the Standard Oil Company? A. Yes; Scofield, Shurmer & Teagle have one at Cleveland.

Q. Do they refine the Lima oil? A. I do not know that; I am not sure about that.

Q. Do you know whether they are doing business at a profit or not? A. No; I do not.

Q. How long have they been in business? A. They have been in business a good many years; I do not know whether they were doing it at a profit, but on general principles I think there is hardly any refinery making money.

Q. They have a large refinery? A. Yes; a pretty good size.

GOVERNMENT OWNERSHIP OF RAILROADS THE ONLY REMEDY FOR FREIGHT DISCRIMINATION.

Q. (By Representative Livingston.) What is your opinion and the opinion of others similarly situated with yourself as to the real reason why these things are not attended to? You seem to think the authority is broad enough. A. Yes; I do. The whole trouble

is because the officials whose duty it is to execute the law don't do it.

Q. Why do they not do it? A. That is what the matter is—why don't they do it? That I can not answer.

Q. Is it political, pecuniary, or what is the trouble? A. I think the trusts and combinations have their powerful influences.

Q. Do you mean in a pecuniary or political way, or both? A. I think they have it politically.

Q. (By Mr. Farquhar.) Do you not think there is a remedy in the Sherman anti-trust act for all of these troubles that have come upon you? A. Yes; certainly I do.

Q. You think the law is sufficient? A. Certainly. All the trusts and combinations could have been destroyed if the Sherman act had been executed in its earlier days.

Q. (By Mr. A. L. Harris.) You know the Knight case was decided may years ago? A. That was before the Sherman act.

Q. (By Representative Livingston.) Do you mean to say that you have no new suggestions or recommendations to give to the commission by which we can amend that law or bring into life a new law by which these trusts and combinations can be controlled? A. I do not think any amendment to any law that you have got will do any good; I believe in government ownership of railroads. I do not believe there is any other way that you can get out of that trouble. We have had 12 years' trial of the interstate commerce act and nine years of the Federal anti-trust act, and have not reached it.

Q. (By Mr. Phillips.) Provided the government did own the railroads and there was absolutely no discrimination in freights, could you refine and market oil in this country? A. I think I could, but I can not do it now. Of course I could not do it so well as I could before this epidemic of combinations came on several years ago, before these mammoth combinations got up. Now they come in and cut prices right where you sell and freeze you out.

Q. If I understand you, any large combination can follow up the small operator and get the markets? A. Yes.

Q. And absolutely destroy him? A. Yes.

Q. If there was absolutely no discrimination? A. Yes, they could do even that without any discrimination and do it by these ill gotten gains that they have secured in the past.

ONLY DIRECT LEGAL ACTION CAN DESTROY THE COMBINATIONS.

Q. (By Representative Livingston.) Then ownership of railroads would do no good unless the other remedy came with it? A. What?

Q. The destruction of the combinations? A. Yes, that would help, you know, to destroy them. Of course, I do not see any other way of destroying these combinations, excepting that the attorneys general of the various states forfeit their charters.

Q. (By Mr. Clarke.) Do we have any power against combinations of foreign countries? A. I do not know why we do not.

Q. Would you repeal the protective tariff? A. I would repeal the protective tariff wherever it affects any trust or combination.

Q. Well, suppose a trust or combination was formed in a foreign country upon some article or line of merchandise that gives them an opportunity to operate against similar productions in this country as strongly as any combination does here. Wouldn't you need a protective tariff to protect you against that? A. I believe in a protective tariff to a certain extent, to the protection of home industries.

Q. (By Representative Livingston.) Provided it is an individual industry? A. Yes, I say to protect the individual more than the trusts. The trouble is that the trusts and combinations are getting all the protection, and the people and smaller fellows do not seem to get it.

(Reading:) "The Chicago, Rock Island and Pacific railway, in which two trustees of the Standard Oil trust, Henry M. Flagler and Benjamin Brewster, were directors, issued on June 13, 1891, a 'special tariff,' including all connecting lines, in which petroleum and its products from Whiting, Ind., are made at Chicago rates as follows:

" 'Current Chicago rates as published in various issues of this company.' "

(No doubt practically in effect today without a published tariff.)

"The Standard Oil trust have at Whiting, Ind., suburb of Chicago, on the Lake Shore, the largest petroleum refining plant in the world.

"FREIGHT DISCRIMINATION OF 110 PER CENT IN 1897, IN FAVOR OF THE STANDARD OIL TRUST."

Now, here is something in 1897; that is pretty late discrimination. Mr. Archbold says you have not had any since 1887. This is up to 1897.

(Reading:) "In 1897 the New York, New Haven and Hardford Railroad Company, in which William Rockefeller is a director, discriminated in freight rates in favor of the Standard Oil trust to the extent of 110 per cent, by which two cars of naphtha, containing car loads for one, applicable to all Standard shipments, this being accidentally discovered."

Q. (By Mr. Jenks.) Where was that proved? A. Why, it was before the interstate commerce commission, and I have got here letters from Mr. Coburn in regard to it, the Liberty Oil Company.

Q. What did the interstate commerce commission decide? A. They have not made any decision yet. I have extracts of the testimony—I do not know but I had better read them—published in the Springfield Republican of March 13, 1898, of different officers of the railroad in regard to it.

Q. Perhaps you had better file this with us so that we will have it on file here? A. I will read a letter here.

Q. You might read the letter and we will take references to the interstate commerce hearing? A. This

is a letter from the Liberty Oil Company, which refers to some of the matters.

(Reading:)

"CHELSEA, MASS., *December* 15, 1897.

"MR. GEORGE RICE, *Astor House, New York, N. Y.*

"Dear Sir: Your esteemed favor of the 14th instant at hand, and your kind feeling toward us in our fight with the Standard Oil Company we certainly appreciate. We are still having a very hard fight with the Standard Oil people here in our tank wagon business, but up to the present time we 'hold the fort.'"

But I was going to say right here that I have seen the original waybills of these; Mr. Marchand of the interstate commerce commission showed me the original waybills showing this.

Q. (By Senator Kyle.) The ones referred to in this case? A. Yes.

(Reading:)

"In regard to the underbilling of Standard Oil Company freight, the paid freight bill of which we hold, will say for your personal use that the whole matter with all papers is now in the hands of Mr. Marchand, agent of the interstate commerce commission, who leaves here today for Washington, and everything looks fair now that we shall be able to procure a criminal indictment against the Standard Oil Company in this case. Both Mr. Prouty and Mr. Marchand of the commission feel confident that they have a sure case, and we shall push it for all it is worth.

"When anything new occurs in this matter I will, both at your own request and at the request of Mr. H. D. Lloyd, keep you posted.

"Thanking you for the interest you have manifested in our welfare, we are,

"Most respectfully yours,

"LIBERTY OIL COMPANY.

"C. M. COBURN, *Manager.*"

(Reading:) "This is a fine expose of what legalized pooling would mean, for this road was a member of the joint tariff association, which comprised all railroad lines east of Chicago—strongest railroad pool ever organized—by which they dictated the rate terms to all lines west of Chicago on which they would be permitted to their traffic to the seaboard.

"Another fine feature about this pool was that they excluded petroleum from the regular classified rate making power and made it subject to special contract.

"On December 14, 1882, the Produce Exchange of New York established, by resolution, and not changed, a gravity weight in the sale of refined oils of 44 degrees which actually weighs 6.4 pounds per gallon, by which the refined oils of the Standard Oil trust are now carried free, to the extent of 4.68 per cent, through under weight."

Q. That applies also to the oil of all their competitors? A. Why, certainly; of course it does; but their having a large amount more makes it greatly to their advantatge, and on their lubricating oils, that are carried at 6¾, it is 15 per cent.

Q. (By Mr. Smyth.) That statement that you make at the top of the page about the two cars of naphtha—was it proved that that was the custom? Was there more than one case or was only one case proved? A. They would not be apt to prove more than one case. That was the only case that came up. There was not, as I understand, any further proof of any other cases. There would not be; this only got out accidentally, you know. You never can find out anything of this kind except it comes out accidentally. It is fair to presume that all their shipments over this line were on this same basis. No question about that whatever.

Q. (By Mr. Jenks.) Do you know what defense they put in? A. Mr. Howard Page, the agent of the Standard Oil Company, went over to Boston and said that it was a clerical error, and it was corrected. They would do that. Of course, they are very nice men and they would probably do that every time. They probably carried a thousand cars there that same way.

(Reading:) "This also applies to paraffin and lubricating oils, fuel oil and residuum, which are carried at 17 per cent less than actual weight. The Standard Oil trust own over 8,000 tank cars, which are paid for every three years, through the allowed mileage rate of three-quarters of a cent a mile each way, another form of freight discrimination, for the railroads pay them three-quarters of a cent a mile to haul back a dead weight empty tank car that is not applicable to general freight like a box car.

Just think of that.

Q. (By Mr. Farquhar.) That applies to all owners of tank cars? A. Yes; but they have got most of the tank cars.

Q. Does it not also apply to the private cars of meat companies? A. Why, yes, of course; it applies to all. But a box car can bring back other freight.

(Reading:) "Receivers Cowen and Murray, of the Baltimore and Ohio Railroad Company, on December 20, 1898, admit that within the territory north of the Ohio river and east of the Mississippi secret rates, drawbacks, rebates and other devices were then in vogue."

If you would like to have it I will read it.

Q. (By Mr. Farquhar.) We have had this fully in the testimony by Mr. Cowen himself. He explains his own letter in the transportation part of it. A. I would like to call your attention to a very important thing.

(Reading:) "Section 6 of the interstate commerce act provides that all original tariff sheets 'shall also state separately the terminal charges and any rules or regulations which in any wise change, affect or determine any part or the aggregate of such aforesaid rates and fares and charges.'"

Now, let us see about that.

(Reading:) "The railroads in gross violation of this section issue and file with the commission general tariff sheets for public use, and then sidetrack these by the issuance of innumerable supplements, special oil tariffs, special circulars, commodity rates, etc., that are often and indiscriminately filed as a substitute to change, cancel and amend the original tariffs, and to such an extent is this done that in reality there is no head or tail left of it—very little of the body—but it stands inviolate for public use.

Now, that is one of the grossest misuses, you know, of the interstate commerce commission by the railroads. Here they come and file a general tariff and the act says here that the general tariff shall state everything that affects the rates, and they do not pay any attention to that and the interstate commerce commission do not enforce it. And why do they not enforce it, I should like to know?

Q. (By Mr. Kennedy.) Do they not say themselves that they have no power to enforce it? A. No power to do that? It is very queer. They can enforce that, I think. I think it is a very flimsy excuse about this no power.

Q. Have not the interstate commerce commission year after year asked to have their power enlarged so that they could enforce their findings? A. Oh, yes. I have understood that, but they have plenty of power to do a good deal more than they do, and they don't do it. I say that is one thing. I say here (reading):

"The query is, why is it that for 12 years the interstate commerce commission have neglected their duty and not corrected this gross evasion of the law, and allowed such special tariffs to be filed, and why is it that all general tariffs omit this wise provision of the law, and why is it that railroads do not comply with the law in any of its essentials, nor are forced thereto?"

What is the reason they don't do it? Because we have not got any kind of a country here that enforces its laws.

(Reading:) "Charles Francis Adams, president of the Union Pacific railroad, had this to say, December 15, 1888, before the Commercial Club of Boston:

" 'The dishonest methods of rate cutting, the secret system of rebates, the indirect and hidden payments made to influence the course of traffic resorted to or devised during the last two years and I do not hesitate to say are unprecedented in the whole bad record of the past.'

"The above charges included eight months' experience of the interstate commerce act, which was, and is today utterly ignored with no effect on lawless railroad freebooters.

"In 1894 an expert accountant discovered that $7,000,000 in rebates had been paid by the Atchison, Topeka and Santa Fe Railroad Company, of which no doubt the Standard Oil Company got the lion's share.

"These discriminations are not now confined to oil, but extend to and cover nine-tenths of the commerce of the country, meat and manufactured products, as well as the products of the soil and mines, which articles today are controlled by the great trusts and combines, and this control has been secured only through unlawful rebates. These combinations having thus obtained the absolute control of the railroads, turn about and dictate the rates of freight these railroads shall charge, and thus dictate what their competitors shall pay.

"I am reliably informed that there is not a railroad leading out of Chicago but has a representative buyer that purchases all the grain shipped over its lines. On this grain 10 to 15 cents a bushel rebate is paid to the buyer, who divides the same with the railroad officials, all of which comes out of the farmer.

"The state exercises its rights of eminent domain to give the right of way to the railroads; the people thus part with their property to these corporations on the faith that they will exercise the franchises thus granted honestly and with an equal hand.

"It is a burning shame that these rights and franchises, the gift of the state, should be administered by railroad magnates to the impoverishment and slavery of the people.

"Free and open transportation and untrammeled opportunities of doing business and virtually closed and sealed.

"The farmer complains of extortion, but is blinded by the secrecy with which it is planned.

"The amount of these fraudulent rebates would pay the interest on the homestead mortgage, earn him a living and make his life contented and happy.

"These discriminations in rates and fraudulent rebates of freight to favored combinations and officials are the crying evil of the day.

"Our laws are overridden, our courts are condemned and our whole social structure is debauched.

Q. (By Mr. Jenks.) You have already explained to us the rest? A. I will put in the following as an exhibit:

"THE INTERSTATE COMMERCE ACT PROVIDES A PENALTY ON CARRIERS AND SHIPPERS, OF $5,000 FINE AND TWO YEARS IN THE PENITENTIARY, FOR EACH AND EVERY OFFENSE, BUT IT HAS NO DETERRENT EFFECT TO STOP REBATES.

"The interstate commerce act provided a penalty on carrier officials, and by amendment, on the shippers, of $5,000 fine and two years in the penitentiary for each and every offense, and with such stringent measures no deterrent effect is had on rail or trust officials. The same old unbroken line of freight discriminations for 27 years in the form of secret rates, drawbacks, rebates and other devices have continued to exist up to date without a break, and for the reason that not a violator of the act has yet been sent to the penitentiary to atone for his misdeeds.

"IT IS QUITE EVIDENT FROM THE FOLLOWING FACTS THAT THE STANDARD OIL TRUST HAS ONLY MADE CRUDE PETROLEUM CHEAP TO THE PRODUCER WHILE IT MAKES THE PRODUCTS THEREOF IN COMPARISON HIGH PRICED TO THE CONSUMER.

"It is ridiculously absurd to say that the Standard Oil trust has made oil cheap, and all that is necessary to refute such false assertions is to refer to a pamphlet issued by Solicitor Dodd in 1888, in which he broadly asserts that over production was the cause of making crude petroleum cheap, but in subsequent speeches he couples the products thereof with it.

"Petroleum products are as much higher than they should be as the overcharges of freight discrimination this monopoly receives; for all freights are purposely advanced and made that much higher in order that

greater discriminations may follow, which the consumer is forced to pay in higher priced oil. Today, and for many years back, this monopoly has charged producers of oil in the oil producing regions 20 cents a barrel for local pipage not costing five cents, or four times more than it costs, and when crude oil sells at 50 cents a barrel this charge is 40 per cent of its market value. This is the how of it that this monopoly makes crude oil so cheap to the producer. The Standard Oil trust admits cost of local pipage of five cents a barrel. (B. 102.)

"Today and for many years back, in conspiracy with the railroads, it has charged the same pipage rates to the seaboard as the railroads charge ,and today this conspiracy charge is 10 times more than the pipage cost—that is to say, the present rail rate from the oil regions to the seaboard is 16½ cents per 100 pounds, and on 320 pounds in bulk to the barrel equals 52.8 cents per barrel, while the pipage does not cost to exceed five cents a barrel—and this is another way this monopoly has of making crude oil cheap to the producer and high to the consumer.

"Mr. F. B. Thurber seems to be an outside champion for this monopoly, and says it has made oil cheap, because in 1871 the average price of refined oil for export was 25.7 cents per gollon, while in 1898 it only averaged 5.7 cents per gallon, and gives the following reasons thereof:

" 'This great decline in the price of oil is attributed partly to the increase in production, but more largely to improvements in manufacture and transportation, which were only attainable through the aggregation of capital in this industry.' "

This man has no experience whatever in the oil business, but he is the champion of the Standard Oil trust. They put him forward here as an outside man.

Q. (By Mr. Clarke.) Do you dispute his statement that it was only attainable through the aggregation of capital in this industry? A. Yes; I do dispute it.

(Reading:) "Why is it that Mr. Thurber does not enlighten us and give the reason why refined oil for export was reduced 35 cents a gallon, or $17.50 per barrel, from 61½ cents, average price in 1861, to 26½ cents, average in 1870? I presume his reasoning would be that the Almighty did that, while the Standard Oil monopoly engineered all the balance without His aid or assistance.

"Why is it that eastern home dealers and consumers of refined oil, just previous to the entering of home competition at the seaboard, April, 1896, had to pay more than twice as much for their oil as foreign consumers for export? The price per gallon in bulk to retail dealers was 9½ cents a gallon, and for export 4½ cents a gallon, with crude oil $1.20 per barrel, and this is how the Standard Oil is made so cheap.

"Why is it that Mr. Thurber does not enlighten this committee and give the reason why in 1892 refined oils were selling in several of the states, like Texas, Utah and Idaho, at four times the price of export oil for foreign consumption? In Wyoming and Nebraska it was three times as much, and in Arkansas, Alabama, Florida, Georgia, Mississippi, Missouri, North Dakota, South Carolina, South Dakota, Tennessee and Washington double the export price."

This is all fully explained, gentlemen, in my exhibits here, B. 171, etc.; and my own experience in finding out all over the United States, by sending out special circulars in 1892, shows those facts to be absolute and the details are in my exhibits full and complete.

(Reading:) "The Pennsylvania Railroad Company up to August 28, 1888, carried same number of gallons of refined oil in a barrel (including the package) at same price as bulk oil in tank cars to offset the return dead weight of the return tank car, when by the power of the Standard Oil trust and under the interstate commerce act 25 per cent more freight has been charged since that time. The rate of freight in 1887 was 52 cents a barrel, or 13 cents per 100 pounds. Today it is 16½ cents or 27 per cent higher.

"Today it costs 25 per cent more to ship the same number of gallons of oil in a barrel than it does by bulk in a tank car, because the railroads will not furnish the tank cars in which to ship it. The competitive independent refiner who can not afford to purchase tank cars is subject to the very important discrimination and can not compete, and he can not help himself. This is the how of it that the Standard Oil monopoly makes oil so cheap to the consumer. In the case of export it had to sell its oils at a fair living price, owing to Russian competition, while to general consumers in America, for want of competition, it charges fabulous prices, double, treble, and four times as much owing wholly to the power of this monopoly to dictate to the railroads the high tariff rates their competitors must pay, while their own goods are carried at nominal figures through the grossest of the gross rebates or freight discriminations. The absurdity of Thurber's reasoning may be further illustrated when I state that the cost of refining petroleum from 1871 to 1880 did not exceed one cent a gallon, and from 1880 to 1890 not over half a cent, and from 1890 to the present time it has not cost this monopoly to exceed one-quarter of a cent a gallon, and to the average independent refiner about one-eighth more, so that improvements in manufacture cut no figure, while the monopolistic and most extraordinary charges for pipe transportation could only be maintained through the power of the railroads. Mr. Thurber would manifestly have been more correct if he had stated that the price of petroleum products had been greatly advanced by the standard Oil monopoly through the methods stated by me, and that its unlawful aggregation of capital, so necessary to the business, was thus acquired. Mr. Thurber on November 24, 1882, testified before a legislative committee of New York as follows:

" 'The Standard Oil Company is an example. Here is a corporation which, according to testimony recently given in Pennsylvania, began in 1872 with $1,000,000, which was subsequently increased to $3,500,000, and on this latter capitalization is paid dividends in 1880 amounting to $10,321,812, and it practically controls and fixes the value to the consumer on a staple ranking third in the list of our nation's exports.' "

This is only on one corporation.

(Reading:) "'Through its speculative manipulation it has within a few weeks more than doubled the price of crude oil; and its profits thereby are variously estimated from $20,000,000 to $40,000,000.

COST OF REFINED OIL FREIGHT PAID, 2¾ CENTS.

"The market price of crude oil for the past 10 years —1889 to 1898 inclusive—has only averaged 1¾ cents a gallon, while the local pipage does not cost to exceed five cents a barrel, or one-eighth of a cent a gallon. It does not cost to exceed this amount to pipe same to the seaboard, or an eighth of a cent a gallon more. It can be refined for one-quarter of a cent a gallon, making a total average cost of 2¾ cents per gallon for the past 10 years of refined oil at the seaboard, which is also applicable to interior refineries, to which, if we add one-half cent a gallon as a fair average freight paid by the Standard Oil trust, makes the cost 2¾ cents a gallon, delivered to all interior cities and towns; so that one can form some conception when he buys oil of the immense percentage of profits thus to accrue, which can be turned over every 60 days, and conclusively how philanthropic this trust is in comparison with the prices the consumer is forced to pay. The process of refining oil is very simple, easy as making steam, similar distillation.

"Another method the Standard Oil trust has of making illuminating oils cheap to the consumer is that where they have no regular established agency they give a secret rebate to certain private dealers who have been selling competitive oils, ranging from 25 to $1.50 per barrel, according to the opposing strength of the opponent, to thereafter maintain the regular established card list price made by the trust.

"THE STANDARD OIL TRUST RECEIVES 72 PER CENT ADDITIONAL PROFITS IN THE SALE OF PETROLEUM PRODUCTS, MANUFACTURED FROM LIMA CRUDE THAN FROM THOSE OF THE BEST GRADE CRUDE.

"On September 15, 1895, the produce exchange of New York, through the power of the Standard Oil trust, passed a resolution making the manufactured products from inferior Lima crude petroleum, known as sulphur oil, a good delivery, on a parity with the manufactured products from best grade crude. The average annual market price of this inferior grade crude for past five years—1894 to 1898, inclusive—was 59 cents per barrel as against $1.01½ for the best grade, or the latter 75 per cent higher. Thus it is that the Standard Oil trust received 72 per cent more profit in the sale of manufactured Lima crude products than from those of the higher priced crude, which could not be done except through the power of this monopoly to enforce and exact equal price for both classes of goods, and this is another instance of this great trust making petroleum products from inferior crude so cheap to the consumer. For the past five years—1894 to 1898, inclusive— the total production of petroleum was 279,129,467 barrels, of which Ohio produced 85,306,684 barrels and Indiana 20,608,793 of this inferior grade of crude petroleum, or 38 per cent.

"The last government report for 1898 has this to say about this inferior grade of crude:

"'The product is characterized by the presence of sulphur compounds, which make it of less value for refining purposes than the eastern Pennsylvania product.'

"The refined product from this poor grade crude is adulterated with the products made from the best grade crude, and the results are easily seen by a white film on the lamp chimney that obstructs the light, requires constant attention to turn up the wick to get more light, smokes the lamp, and has an offensive smell. In view of Archbold's laudatory remarks on this particular oil it will be quite refreshing to refer to a caution circular, issued in 1890 by one of the trust corporations denouncing said oil. (B. 166.)"

This is a very interesting circular giving what they think about that oil (B. 166). It tells what the Standard thought of these oils.

Q. (By Mr. Farquhar.) Have they not, under two new processes, eliminated the sulphur and a great many other various ingredients from the Lima oil? A. Partially; but the product from the Lima oil is not near as good as the other oil.

Q. But there has been a great improvement since 1890, since they issued this circular? A. Oh, yes; there has been a great improvement. They have improved the manufacture of it to some extent. I will put it in as an exhibit to show violations of the interstate commerce law.

(Reading:)

"NONCOMPLIANCE AND NONENFORCEMENT OF THE INTERSTATE COMMERCE ACT PRODUCES GROSS DISCRIMINATING FREIGHT RATES, AS TO PERSONS AND PLACES, AND TO THE EXTENT OF 211 PER CENT IN VIOLATION OF SECTIONS 3 AND 4 OF THE ACT.

"The commission constantly receives and places on file without protest thousands of rate tariff sheets that plainly and unequivocally show upon their face gross violations of that all-important section of the act, the fourth section, which says that it shall be unlawful for any common carrier to charge or receive more for a short than a long haul over the same line in the same direction. Today there exists 211 per cent more traffic rate charge on the short intermediate haul over the long haul, as the following figures will show, from statements made to me by the secretary of the commission, July, September, and October, 1899.

"On the shipments of petroleum and its products in car lots over the transcontinental lines, comprising 21 lines of railroad, as merged into that unlawful and changed combination now known as the 'Transcontinental Freight Bureau,' the following two railroads in the pool are cited as samples of the gross violations of the interstate commerce act as they exist today by this association of railways: Chicago to San Francisco, 2,357 miles, via Union Pacific, the present tariff rate is 78½ cents per hundred weight, while the highest intermediate rate to Humboldt, Nev., 1,982 miles, is $1.75 per hundred weight, or 122 overcharge for 325

miles less haul, with a proportionate overcharge on 84 per cent of the total shipments. Ten years ago the intermediate rate overcharge was 56 per cent, now double. From Chicago to San Francisco, via Atchison, Topeka and Santa Fe, 2,652 miles, present tariff rate is 87½ cents per hundred weight, while the highest intermediate rate to Bagdad, 2,017 miles, is also $1.75 per hundred weight, or 122 per cent overcharge for 635 miles less haul, with a proportionate overcharge on 76 per cent of total shipments. Ten years ago the intermediate overcharge was 116 per cent. Present fifth-class commodity rates, via transcontinental lines, Chicago to San Francisco, is $1.65 per hundred weight, the highest intermediate rate is $1.85, or only 12 per cent overcharge. Petroleum products belong to fifth-class, but made special. The Standard Oil Trust has at Whiting, Ind., on the lake shore, suburb of Chicago, the largest refining plant in the world, which is connected by Chicago's belt line with railways to all points in the United States. The southwestern lines, comprising the Southwestern Bureau,' composed of 10 prominent lines of railway, combined with two prominent steamship lines—the New York and Texas Steamship Company and Cromwell Steamship Company—are engaged in an unlawful combination to fix rail and water rates, in violation of the Federal anti-trust act, while they grossly violate the interstate commerce act as to persons and places, and to this extent as samples: From St. Louis to Galveston, Tex., 870 miles, via St. Louis, Iron Mountain and Southern Railway, present tariff rate is 33½ cents per hundred weight, while the highest intermediate rate to Aldine, Tex., 807 miles, is 55 cents per hundred weight, or 64 per cent overcharge for 63 miles less haul, with a proportionate overcharge on 92 per cent of total shipments. From St. Louis to Fort Scott, 338 miles, via the Missouri, Kansas and Texas, owned by Standard officials, of which John D. and William Rockefeller and Joel F. Freeman, former treasurer of the Standard Oil Trust, are directors, present tariff rate is 22½ cents per hundred weight, while to Parsons, 49 miles farther, it is raised to 30, or 36 per cent higher; continues same to Wagoner, 101 miles farther. At South McAllister, 78 miles from Wagoner, the rate is raised to 55, or 80 per cent more. This rate continues to Atoka, 44 miles from South McAllister, while at Coalgate, 43 miles from Atoka, the rate is again raised to 60, or 9 per cent more, while to Denison, 8 miles from Atoka, it is reduced 8 per cent, or to 55, which rate is maintained to Letitia, 1,088 miles, while the rate to Houston, 1,105 miles, is 33½ cents, or 64 per cent overcharge for 17 miles less haul, with a proportionate overcharge on 98 per cent of total shipments.

"THE LONG AND SHORT HAUL CLAUSE OF THE ACT NOT VIOLATED IN THE SHIPMENT OF GENERAL COMMODITIES IN FIVE DIFFERENT CLASSES.

"It is a very significant fact to note that in the transportation of general commodity goods in five different classes, St. Louis to Galveston, as promulgated by the pooled 'Southwestern Bureau' of ten prominent rail lines and two ocean steamship lines, there is no difference between the terminal and intermediate rates. This is in compliance with the law, while in the case of petroleum shipments the railroads adopt the flimsy excuse of water competition and grossly violate the act to the extent of 64 per cent.

"St. Louis to Mobile, by the Mobile and Ohio Railroad, distance 644 miles, present tariff rate is 35 cents per hundred weight, while the highest intermediate rate to Eight Mile Station, 636 miles, is 57 cents, or 63 per cent overcharge for 8 miles less haul, with a proportionate overcharge on 98 per cent of total shipments. From Memphis to New Orleans, via the Yazoo and Mississippi Valley Railroad, 445 miles, present tariff rate is 17 cents per hundred weight, while the highest intermediate rate to Norwood, La., 329 miles, is 33, or 94 per cent overcharge for 126 miles less haul, with a proportionate overcharge on 72 per cent of total shipments. From Cincinnati to New Orleans, by the Queen and Crescent route, 826 miles, present tariff rate is 22½ cents per hundred weight, while the highest intermediate rate to Poplarville, Miss., 756 miles, is 44½, or 97 per cent overcharge for 70 miles less haul, with a proportionate overcharge on 91 per cent of total shipments. These same rates have been continuous for the past ten years.

"From Cincinnati to Vicksburg, same line, 770 miles, present tariff rate is 22½ cents per hundred weight, as against an intermediate rate of 45½ to Brandon, Miss., 711 miles, or double—100 per cent more for 59 miles less haul, with a proportionate overcharge on 92 per cent of total shipments.

"From Louisville to Mobile, 670 miles, via Louisville and Nashville Railroad Company, present tariff rate is 18 cents per hundred weight, as against an intermediate class rate of 56 to Flomaton, 609 miles, or 211 per cent overcharge for 61 miles less haul, with a proportionate overcharge on 90 per cent of total shipments, with no change in rates since the partial decision of April, 1892, except in one instance, although directed by the commission to revise and correct these general overcharges. In 1889 the highest intermediate overcharge was 146 per cent, now 211, or 65 per cent higher.

"From Cairo to New Orleans, 550 miles, via Illinois Central, present tariff rate is 29 cents per 100 pounds, as against an intermediate rate of 41 to Mauchac, Miss., 513 miles, or 42 per cent overcharge for 37 miles less haul, with a proportionate overcharge on 93 per cent of total shipments.

"From Louisville to New Orleans, same line, 847 miles, present tariff rate is 18 cents per 100 pounds, as against an intermediate rate of 35 to Sauve, La., 842 miles, or 94 per cent overcharge on 5 miles less haul, with a proportionate overcharge on 99 per cent of total shipments.

"Louisville to Memphis, same line, 392 miles, present tariff rate is 12 cents per hundred weight, as against an intermediate rate of 34 to Lucy, 379 miles, or an overcharge of 183 per cent for 13 miles less haul, with a proportionate overcharge on 96 per cent of total shipments.

"It must be conceded that the lesser terminal rates must be paying ones or there would be no object in

the roads allowing such shipments. The Interstate Commerce Commission hold that established tariff rates must be remunerative. Thus it is that the inhabitants of regions through which these lines of railway run are forced by railway tariff exactions to pay 42 to 211 per cent more for the products they buy than they should pay.

"By prepayment of freight at the low-car terminal rate the Standard Oil Trust is allowed to stop off its cars at high-rate intermediate points and thus receive an advantage of 42 to 211 per cent over their competitors. It also has the extra privilege to divide up full-loaded tank cars into less than car lots that should have paid three times the terminal rate, although, as an owner of tank cars, I was denied this privilege.

"Common carriers, under section 4 of the act, are not allowed to violate the long and short haul clause of the act without permission from the commission. From December 17, 1895, to August 4, 1896, I made complaint to the commission that it was their duty, under section 12 of the act, to proceed against violators of section 4 of the act (long and short haul). They would not act, but said that I might. Knowing from the answer that my action would be futile, I did not act any further in the matter.

"The State exercises its right of eminent domain to give the right of way to the railroads. The people thus part with their property to these corporations on the faith that they shall exercise the franchise thus granted honestly and with equal hand.

"It is a burning shame that these rights and franchises, the gifts of the state, should be administered by railroad magnates to the impoverishment and slavery of the people.

"The United States Supreme Court, on March 30, 1896, Social Circle Case, fully upheld the statutes and decided that in this case railroads could not charge more for a short haul than for a long haul over the same line in the same direction. This decision has had no deterent effect whatever on present railroad violators, as the evidence here plainly shows."

I will also put in here as an exhibit. (Reading:)

"CLEMENT A. GRISCOM, PRESIDENT OF THE NATIONAL TRANSIT COMPANY (A STANDARD TRUST), AND AS A DIRECTOR IN THE PENNSYLVANIA RAILROAD COMPANY, MAKES CONSPIRACY AGREEMENT FOR AND ON BEHALF OF ALL TRUNK LINES TO THE SEABOARD AND OF THE TIDE WATER PIPE COMPANY, SUPPOSED COMPETING PIPE LINE, FOR MAINTENANCE OF PIPE WITH RAIL RATES, TEN TIMES ABOVE PIPAGE COST EXISTING TODAY.

"On October 9, 1883, to take effect October 1, the National Transit Company, for and on behalf of the Standard Oil Trust, made an agreement with the Tide Water Pipe Company by which it allowed them 11½ per cent of the total pipe line transportation of petroleum to the seaboard. It also guaranteed them $500,000 per annum profits for 15 years, or $7,500,000 Within three months after contract was made refined oils advanced 87½ cents per barrel, crude oil 1¾ cents. This contract gave these pipe lines 74 cents a barrel advantage over rail rates, but what followed? On August 22, 1884, the Pennsylvania Railroad Company, for and on behalf of the National Transit Company and as representing the Tide Water Pipe Company, entered into a conspiracy agreement with all existing pipe lines to the seaboard for the maintenance of equal pipe line rates with rail rates in the transportation of petroleum and its products from the oil regions to the seaboard, which agreement is in practical effect today, with or without a contract, as rail and pipage rates are the same. The Standard Oil Trust ostensibly guaranteed 26 per cent of all such traffic to the sea, or, in the language of the agreement, 'all petroleum brought to the Atlantic seaboard by all existing carriers,' railroads and pipe lines combined, establishing much higher joint pipe and rail tariff rates than should be, a complete and perfect monopoly 'in restraint of trade' of all petroleum transportation to the seacoast, for eastern home consumption and for export, at ten times pipage cost, in violation of the Federal anti-trust act and of the interstate commerce act.

"This guaranty in reality guaranteed but little. It, however, blinded the eyes of the innocent dupes—unsuspecting railroad directors and stockholders. This 26 per cent was largely covered in the transportation of the by-products of petroleum that could not be piped, such as benzine, naphtha, and gasoline, lubricating paraffin oils, residuum, etc., besides accounting for and including in the guaranty competitive shipments. This kind of an agreement is easily accounted for when made by joint interested parties in the trust certificates of the Standard Oil Trust. This is another peculiar method that this joint conspiracy combine has of making crude oil cheap to the producer and the products thereof high to the consumer.

"Franklin B. Gowen says in regard to this contract as follows:

" 'By which it will be proved that the rate on oil prior to the making of that contract was one-half of what it was before the recent advance, of which we complain, was made.

" 'Our allegation about that contract, gone into in this testimony, although it was not admitted, is this:

" 'The National Transit Company secured a pipe line to tide water. They then became a transporter of oil.

" 'It was important for them to maintain a high rate on the transportation of that oil, because they made a great deal of profit out of it.

"They could not maintain a high rate on the transportation of oil if that rate was cut under by the railroad company, and we allege, and will endeavor to prove in this case.

" 'That within two years prior to the making of this contract the rate on the Pennsylvania Company for oil was one-third of what it now is.

"If that had been continued the pipe line could not have made one-third as much money as they do now—could not have made one-fifth as much money as they do now—because the cost would have been the same.

" 'They then entered into a contract with the Pennsylvania Railroad Company for a division of the rate, and agreed to make equal rates. It became to the interest of both parties to get high rates.

" 'The consequence of which is that this contract provides that the National Transit Company shall pay practically several hundred thousand dollars a year as a bonus, over and above fair earnings of the railroad, in consideration of the railroad's maintaining a high price on oil.

" 'Of course, if the National Transit Company could make people using their pipes, or using the railroads, pay 52 cents a barrel for having the crude oil transported, when it cost them about 5 cents, as we say, to do the business, they would have an advantage of 47 cents per barrel over any competitor at tide water, and ,with a view of maintaining such advantage, they entered into this contract with the Pennsylvania Railroad, which contract, as we allege, guaranteed to the Pennsylvania Railroad Company 26 per cent of the entire oil business transacted by the railroads and the two pipe lines.

" 'They then both agreed to maintain equal rates.' "

I will read the heading on page 61. (Reading:)

"Railroads allow Standard Oil Trust to lay its pipes in the road's right of way, in consideration of the road having only the pipe to transport, thereby losing all its former oil freight."

The following was offered by the witness as an exhibit:

"Dan O'Day, general manager of the pipe line system of the Standard Oil Trust, testified before a Congressional committee, 1888, that the Chicago and Atlantic Railroad allowed this trust to lay its pipes from the Lima oil fields to Chicago in the roadbed's right of way, for the profit it received in the transportation of the pipe, its material, and construction.

"After the road granted these most extraodinary of privileges (1888) and after the pipe line was constructed and the trust's mammoth refining plant at Whiting, Ind., suburb of Chicago, was finished, freight rates from the Lima oil fields to general points of delivery in the various States were raised from 20 to 87 per cent

"The present freight rate, Lima to Chicago, is 10 cents per 100 pounds, or 40 cents a barrel, eight times its pipage cost.

"THE UNITED STATES PIPE LINE COMPANY HAS BEEN TRYING FOR SEVEN YEARS TO GET ITS TWO PIPE LINES, CRUDE AND REFINED, FROM THE OIL REGIONS TO NEW YORK BAY, THROUGH THE STATE OF NEW JERSEY, AND NOW MUST ABANDON IT, BECAUSE OF JOINT OPPOSITION OF THE RAILROADS AND OF THE STANDARD OIL TRUST.

"For seven years the United States Pipe Line Company has endeavored to get its two pipe lines, crude and refined oil, through the State of New Jersey to the seaboard at New York, but has been obstinately opposed by the rail lines and the Standard Oil Trust from crossing under railroad tracks, although the owner of the fee right, while the roads have an easement only. New Jersey courts have finally decided that this cannot be done. Resulting consequence is that this company's pipe lines are being taken up, Philadelphia made the terminus, and the oil will be barged to New York. But the Standard Oil Trust have had no trouble, and even her lines lie in the road beds of many railroads.

"Lewis Emery, Jr., of Bradford, Pa., producer, refiner, and transporter of petroleum, has this to say, October 5, 1899, to a correspondent:

" 'We are very large manufacturers of oil and oil products, and feel the discrimination in rates over the railroads very severely indeed, so much so that we are obliged to market 70 per cent of our products in Europe.' "

An exhibit will show the favor of railroads to exporters. (Reading:)

"ON AUGUST 1, 1899, 50 PER CENT MORE IS CHARGED BY THE RAILROADS TO CARRY GRAIN FROM CHICAGO TO NEW YORK FOR DOMESTIC USE THAN EXPORT FOR FOREIGN CONSUMPTION. WITHIN THREE MONTHS, BY NOVEMBER 1, 1899, DOMESTIC RATES HAVE BEEN RAISED 30 PER CENT AND EXPORT 80, WITH REBATE ON EXPORT QUANTITY SHIPPED."

"The tariff sheets on file with the Interstate Commission to take effect August 1, 1899, show that in shipments of grain, Chicago to New York, the export rate was 11 cents per 100 pounds, while the domestic rate was 17 cents, or 50 per cent higher to eastern home manufacturers and consumers. The present rate on export, November 1, 1899, is 20 cents per 100, as against 22 domestic, or only 10 per cent of a difference. Within three months, August 1 to November 1, 1899, domestic rates have been raised 30 per cent, while export rates have advanced 80 per cent, and the difference between domestic and export rates has been reduced 40 per cent within three months. But this apparent advance in export rates will easily be wiped out in a rebate on quantity shipped, as a substitute for a moneyed rebate, as follows:

"Hon. Franklin B. Gowen, president of the Philadelphia and Reading Railroad Company, stated before the Interstate Commerce Commission, January 17, 1888:

" 'Mr. Colston. What kind of a train is that?

" 'Mr. Gowen. It is a long train of loaded cars which, though visible to the sight and susceptible of identification by all the other senses, makes no impression upon the manifests of the corporation, and leaves no trace upon the treasury of the company. This gentleman to whom I allude, in search of statistics, was struck with the fact that in one certain year the amount of grain which left Boston, New York, Philadelphia, Baltimore, and Portland in vessels for Europe, was much greater than the aggregate amount transported over the railways from the west to those points in the same period, and yet he knew that a large amount of grain transported from the west to the east is used for home consumption and does not enter into foreign commerce at all; and the only reason that he could give for this anomaly in statistical information was supplied by the report of ghost trains as a favored method of transportation by some celebrated shippers who were then supplying the European demand for our cereals.'

"Also said:

" 'What is a railway? A public highway—nothing else. Just like the rivers. The rivers are public highways. Nobody in this country, the Standard Oil Trust or other inferior character, attempts to put a tourniquet upon them. When the first public roads were made in this country they were turnpike or wagon roads; but they were public highways. No company attempted to make a different charge for toll to one man as against another for the like vehicle. When the railroad companies were organized they took the private property of the citizen, under the right of eminent domain, because the property was taken for a public highway in trust for the uses of the public; and the first railway companies in this country were organized simply with the right to maintain a public highway and to charge a toll for its use. It was expected that the transporters should furnish their own cars and their own locomotives or horses, because originally the service on railways was done by horses. Railroads are simply advanced and improved avenues of transportation; but, with reference to the rights of the community to equality of rates, they preserve thoughout the same features as the rivers and turnpikes. Now, why should there be any difference now existing? God made the rivers, and man laid the rails, I suppose our friends will say, and hence the Standard Oil Company deserves to have the monopoly of low rates.

" 'The gross receipts of the railroads of this country, in round numbers, are $800,000,000 per annum, and I verily and honestly believe that $100,000,000 annually are taken out of the pockets of the people of this country by unjust railway discriminations and turned over to this privileged class—and this is equal to a tax of $2 per head paid by the people for the sake of building up the new aristocracy of wealth that in this free country arrogate to themselves the position of the nobility of older countries. And who compose this privileged class and constitute this new order of nobility? Not men of intellect, or genius, or learning, or even of honest thrift, or patient industry. By no means. Cold, calculating men, who, by open bribery and naked rascality, secure the favor of railroad officials, until they wring $100,000,000 annually from the mass of the people and the overburdened industry of the country. These are our privileged classes; these are the men whose patents of nobility are inscribed upon the records of a railway company—attested by the broad seal of the corporation and countersigned by a general freight agent—and when people from other lands visit this country and ask to see our great men we do not say, This is a man of great intellect and genius and learning, or of long descent, of kindly character, and great charity; but we say, Behold him whom the railroads delight to honor, and the limits of whose wealth we are only permitted to conjecture!

" 'It is utterly impossible that there can be any success attending a monopoly of natural products without the aid of unjust discrimination of railroad companies. And only when such unjust discrimination ceases will all people be placed on terms of equality.

" 'Let us suppose that in France but one corporation handled 80 per cent of the wine grown in the country. The grape grows all over the country. You see train loads of wine in France as frequently as you see train loads of oil in America. The price of wine enters largely into and affects the social and financial condition of the French people, just as the price of oil affects the interests of the people of this country who produce it. I venture to say that if any such thing existed in France as one corporation controlling 80 per cent of the wine manufacture and traffic of the country there would be a French revolution within 24 hours of the discovery of the existence of such a monopoly.

" 'The system of illegal and unjust railroad rebates or freight discriminations, more than any other social evil, has been the source of that unequal distribution of wealth which today confronts the country with a menace greater than threatened by any other social wrong or inequality. That the Standard Oil Trust owes its control of the oil trade of the country entirely through unjust and illegal discrimination in charges of railroad freights. That nearly all of its great wealth and power have been thus dishonestly and illegally obtained. That it is far the most conspicuous example among the many instances of the great fortunes made by the favoritism of railway officials.' "

The Standard Oil monopoly is the originator of the system of devices for rebates in the form of commissions, arbitraries, billing underweight, blind billing, dockage, lighterage, terminal charges, special style tank cars, overloading, billing to intermediate points at the low rate, stopping cars in transit and delivering small lots at carload rates, 'ghost trains' on which no freight is paid, commissions or rebates on all competitors' shippments, shiping out from its agencies to surrounding territory and paying no freight thereon, that today permeates all the arteries of commerce exclusively in favor of the trusts, effectually wiping out and closing up all competitive industries.

Q. (By Mr. Kennedy.) Will you tell us something about these ghost trains—what they are? That is something new to me. A. That is what Mr. Gowen explains at the beginning of the quotation that I have just put in.

(Reading:) "These freight discriminations in favor of one great trust, the Standard Oil Trust, have enabled that concern to build, free of cost, thousands of miles of gathering pipe lines in the oil producing country, thousands of huge iron storage tanks, several trunk lines of pipe from the oil regions to the seaboard, thousands of tank cars, and tens of thousands of stationary plants (represented by local agencies located in all parts of the Union), which stand as a menace and a threat to all competitors who dare enter their sacred domain in competition with them.

"Whoever interferes with the natural laws which govern or ought to govern commerce is a public enemy. No other nation under the sun would tolerate for an instant such a destructive element within its borders. In monarchical Germany Baron H., in one short month, was tried, convicted, and sentenced to imprisonment for receiving a rebate from a railroad. In England the owner of the Bass breweries was found

to be receiving a rebate, and in twenty-four hours it was stopped by the railroad commission. What a contrast, my countrymen, does our land present.

"'The time to guard against corruption and tyranny,' says Thomas Jefferson, 'is before they have got hold of us.'

"That the Germans appreciate this wisdom is shown by the attitude of the German Government toward the Standard Oil Company. When some member of the Reichstag, alarmed by the apparition of the original and greatest 'octopus,' asked what the Government proposed to do, Count Posadowsky, minister of the interior, showed that the most vigorous and effective campaign possible had already been opened. 'And,' he added, 'the Government will oppose abuses on the part of the Standard Oil Company immediately and ruthlessly.'

"The American, Philadelphia, February 12, 1898, has the following:

"'It is often remarked that it is impossible to make something out of nothing. This is indeed regarded as a truism. But when we look at the growth of the Standard Oil trust we are inclined to doubt our senses. Self-evident it is, indeed, that we can not create something out of nothing, but something very akin to this have the men behind the Standard Oil Trust succeeded in doing. They have not, indeed, accomplished the impossible, but they have found something better than the alchemist's equation, something more important in the accumulation of wealth without labor than the possession of the philosopher's stone. The alchemists sought to turn base metal into gold and failed; the unscrupulous men who organized the Standard Oil Company sought to turn dishonesty into gold and they succeeded. They have not, indeed, discovered the undiscoverable art of making something out of nothing, but they have succeeded in getting property without creating it, in enjoying wealth without earning it.'

"The New York Sun, in its financial article of September 4, 1899, has this to say:

"'The Standard Oil monopoly has sustained itself by getting possession of all the available crude petroleum wells in the country, and by not raising the price of the refined oil so high as to make other illuminants more desirable it has shut out competition from that quarter.'"

I thought it well enough to read that because it comes from a strong monopoly paper.

(Reading:) "Benjamin F. Butler says this: "The Parliament of Great Britain undertook to put a tax of a penny a box on friction matches, which would have increased the revenue about $500,000. The people of England revolted to such an extent that the government dare not press it. The match was needed to light the petroleum lamp. What would be said in Great Britain if their government would allow a corporation to put a tax of 500 per cent on the means of lighting the poor man's house and the rich man's palace in England?

"'Under that government it would not be borne, not an hour after it was known. Shall it be said that under a republican form of government, where the people are represented in making the laws, such a monopoly shall obtain, by which men can make fortunes such as were never dreamed of since the days of the plundering of the world by the proconsuls of Rome?'

"To the great credit of the United States Supreme Court, they have taken a broad and liberal view of the Sherman anti-trust act, and decided that it 'applies to and covers common carriers by railroad,' which adds vital importance to the act, and, in brief, decided as follows: While the statute prohibits all combinations in the form of trusts or otherwise, the limitation is not confined to that form alone. All combinations which are in restraint of trade or commerce are prohibited, whether in the form of trusts or in any form whatever.

"SINCE THE FEDERAL ANTI-TRUST ACT TOOK EFFECT, 1890, THERE HAVE BEEN CONSOLIDATED 946 RAILROADS, AGGREGATING 63,000 MILES, OR ONE-THIRD OF TOTAL.

"On October 7, President M. H. Vreeland, of the Metropolitan Railway Company, had this to say:

"'Probably in no industry in the world has consolidation been more active in the last ten years than in railroads. In fact, railroad history of that period is one continuous record of combinations, amalgamations, mergings, leasings, or whatever terms lawyers please to give to one and the same thing. In the nine years since 1890, 946 railroads, aggregating 63,000 miles, have been consolidated.'

"Just think of it; 946 different railroads consolidated into a mammoth railroad trust, one-third of total railway mileage, within nine years (passage of the anti-trust act), forming part and parcel of 44 separate and distinct unlawful associations of rail and water lines combined, acting in entire unison with the other lines for the maintenance of railroad rates, which puts into the hands of a few leading men an unlimited and mighty power of control over transportation rates, which power they have extended to the creation of many industrial manufacturing trusts, by which the price of the products thereof will be entirely regulated by these men through high tariff transportation rates, that greater rebates shall accrue to them from off their own and competitive shipments, which completely annihilates competition, destroys competitive industries, and the incentive to embark in new enterprises. In other wrods, the conspiracy combine of rail and trust officials now dictates to the former competitor the amount of salary he will receive to help them conduct and carry out their unlawful designs.

"THE RAILROADS AND INDUSTRIAL TRUSTS' ARE CAPITALIZED AT $18,818,554,031.

"The aggregate capitalization of the railroads per last official report of the Interstate Commerce Commission is $10,818,554,031. The single State of New Jersey has given life to 15,000 concerns with a capitalization of $8,000,000,000. For the fiscal year ending October 1, 2,000 corporations were chartered in this State, capitalized at $3,500,000,000. Here is a joint railroad and industrial trust company, capitalized at $18,818,554,031, working exclusively in the interest of each other. Conservative authorities estimate that

one-half of this amount is ficticious, or 'watered,' on which rail and trust officials have enforced, and will continue to enforce, from off the producer of the soil and mine and from off the consumer and user of general products, through railway tariff exactions, sufficient revenue to pay liberal dividends upon fraudulent issues, representative waste paper, merely vignettes and nothing else. Ruinous freight charges will be levied upon all competitive goods outside the combinations in order to freeze them out, while Armour will receive rebates on his beef, Havemeyer on his sugar, Morgan on his coal, and Rockefeller on oil and iron, while the dealer outside the trusts must ship at higher prices, without rebates and without favor. Under the liberal laws of New Jersey alone these 15,000 trusts and corporations are operating in every section of America, and this State has richly earned the sobriquet of 'The cradle of monopolies.' With all this vast wealth centered in one State, how easy it is to elect and manage all necessary political power for the control of all needed legislation.

"How easy for this combination of railroad and trust officials to so increase and temporarily reduce transportation rates, and thus materially affect net earnings of the railways and of the trusts, by which they get a clutch on their adversaries in stock gambling operations, and without risk, in the purchase or selling of stocks short, according to their well-matured plans and conspiracies."

(Reading:)

"THERE ARE TODAY AT LEAST 44 UNLAWFUL RAILROAD TRAFFIC ASSOCIATIONS AND WATER LINES COMBINED, ACTING IN ENTIRE UNISON TO INCREASE AND MAINTAIN FREIGHT CHARGES AND DISCRIMINATE IN FAVOR OF THE TRUSTS ON ALL RAIL AND WATER TRANSPORTATION RATES IN VIOLATION OF THE INTERSTATE COMMERCE ACT AND OF THE FEDERAL ANTI-TRUST ACT.

I will put in as exhibits the following:

"By the Official Railway Guide of September, 1899, there exist today 44 separate and distinct illegal combinations, composed of joint railroad, lake and ocean steamship lines, thus precluding excuse for water competition.

"These several pooled traffic associations and freight committees (latter new term) represent all the principal railroads and water lines in the United States, and some of the Canadian railways, working unitedly and in unison for the unlawful maintenance of joint freight rates, both rail and water, which is in the 'restraint of trade,' as forbidden by the Federal anti-trust act and confirmed by the Supreme Court.

"Section 5 of the interstate commerce act reads as follows:

" 'That it shall be unlawful for any common carrier subject to the provisions of this act to enter into any contract, agreement or combination with any other common carrier or carriers for the pooling of freights of different and competing railroads, or to divide between them the aggregate or net proceeds of the earnings of such railroads, or any portion thereof; and in any case of an agreement for the pooling of freights as aforesaid, each day of its continuance shall be deemed a separate offense.'

"The names of these combinations are changed as often as the Supreme Court renders a decision against any one of them applicable to all, but the roads will not submit to the act nor to court decisions.

"The following steamship lines represent the Association of Lake Lines:

"Western Transit Company, owned by the New York Central and Hudson River Railroad Company, transports freight to and from Buffalo and Chicago, touching at Erie, Cleveland, Detroit and Milwaukee.

"Union Steamboat Company, owned by Erie Railway Company, carries freight to and from Buffalo and Chicago, touching at Detroit and Milwaukee.

"Erie and Western Transportation Company (Anchor Line), owned by Pennsylvania Railroad Company, carries freight to and from Buffalo, Erie, Chicago, Milwaukee and Lake Superior ports, and delivers freight to all railroads.

"Northern Steamship Company, owned by Great Northern Railway, carries passengers and freight to and from Buffalo, Cleveland, Detroit, Duluth and Lake Superior ports, and delivers freight to all railroads.

"Lake Erie Transportation Company, owned by Wabash railroad. Its steamers run between Buffalo and Toledo and deliver freight to all railroad lines.

"Lehigh Valley Transportation Company, owned by the Lehigh Valley Railroad and its steamers run between Buffalo and Chicago.

"Minneapolis, St. Paul and Buffalo Steamship Company, owned by the Minneapolis, St. Paul and Sault Ste. Marie Railroad Company, which is controlled by the Canadian Pacific Railway Company, carries freight between Gladstone and Buffalo and delivers same to all railroad lines.

"Cleveland and Buffalo Transit Company; Detroit and Cleveland Navigation Company; Lackawanna Transportation Company; Port Huron and Washburn line; Lackawanna Green Bay line; Wilson Transit Company; Union Transit Company; Fleming line.

"In addition the following water lines are combined with railroad associations and freight companies:

"Plant system of steamers, operating 1,283 miles of water lines; New York and Baltimore Transporation line; Baltimore, Chesapeake and Richmond Steamboat Company; Merchants and Miners' Importation Company; Detroit and Cleveland Navigation Company; New York and Texas Steamship Company; Old Dominion Steamship Company; Cromwell Steamship Company; Atlantic Coast line; Ocean Steamship Company; Red River line.

"This Official Railway Guide also contains the Canadian Freight Association, composed of all the railways and principal water lines of Canada, which are in collusive alliance with our unlawful pooling railway combinations as represented in said association by the following American lines, such as the New York Central and Hudson River, Michigan Central, Delaware and Hudson, Boston and Maine, Central Vermont, Maine Central, Great Northern, Northern Pacific and Manitoba, which roads are linked with Can-

ada's water ways, such as the St. Lawrence Steamboat Company, Lake Ontario Steamship Company, Merchants' line of steamers, Northwest Transportation Company, Bay of Quinte line of steamers, Bay of Quinte Railway and Navigation Company, forming a gigantic trust and pool of rail and water lines of America and Canada to increase and maintain, without competition, unlawful transporation rates in the United States, which is in restraint of trade, in violation of the Federal anti-trust act, and also in violation of the interstate commerce act.

"The following are the water lines in the above association:

"The Clyde, New England and Southern lines, Portland Steamship Company, Goodrich Transportation Company, Lake Michigan and Lake Superior Transportation Company, Northern Michigan Transportation Company.

"October 1, 1889, the Transcontinental Association, composed of 21 lines of railroad including the Canadian Pacific railway, made an agreement with the Pacific Mail Company to pay them $900,000 per annum for the privilege to fix all freight and passenger rates, both steamship and rail, both ways, between New York and San Francisco, 'and that no through freight or passengers shall be taken except at prices fixed by the party of the first part (Transcontinental Association), or by its consent. (B 194.) No question of doubt, a similar arrangement is in practical effect today.

"November 28, 1890, this same association agreed with the Canadian Pacific Railway Company to pay them $500,000 per annum 'to maintain the rates and rules of the Transcontinental Association as in force on the direct United States lines.' Benjamin Brewster and Henry M. Flagler, then trustees of the Standard Oil trust, were also directors in the Chicago, Rock Island and Pacific railroad, one of the roads in the combine, while Oliver H. Payne, former treasurer of the Standard Oil trust, was a director in the Pacific Mail Company. (B 196.)

"Judge Willis, of St. Paul, Minn., in addressing the new grand jury on January 9, 1897, has this to say:

" 'The government of this state is divided into three departments—the legislative, executive and judicial. All of these departments are proximately connected with the common people. To the legislature any qualified elector may be chosen. In the executive department the same rule of eligibility exists. In the judicial department none but men learned in the law can be selected for the judiciary itself; but in order to link that department closely to the people it has been provided that grand juries should be summoned from time to time, and that to them should be committed the duty and prerogative of scanning the conduct of all members of society and making such accusations as would correct the evils in society which amount in their enormity to crimes. Consequently you have the whole field of society before you.

" 'You must bear in mind that when criminality rears its head and becomes dangerous to society it does so because the people themselves, represented in the grand juries, fail to execute with vigor the judicial department of the government. As grand jurors you are officials of the judicial department of the state government. A weighty responsibility rests upon you.

" 'The literature of our day, both transitory and permanent, is filled with denunciations of those enormous aggregations of capital which threaten to destroy not only the symmetry of our social conditions, but the essential nature of those social conditions. We hear much of trusts and of combinations, of railway pools, and of associations which are detrimental to the public benefit. Now, if the grand jury retains the vigor and essential patriotism which constituted the fathers of the republic, all these abuses will be annihilated.

" 'It is a mere idle performance for the people to claim patriotism when they themselves countenance and tolerate the most flagrant abuses.

" 'It is indeed a performance of questionable propriety to stand in the market place or upon the public rostrum and bewail the existence of abuses and the oppressions of financial and commercial tyrants instead of setting the judicial machinery known as the grand jury in operation for the correction of these abuses and for the dethronement of the tyrants. A grand jury should realize its power; should comprehend its functions; should, like Siegfried in Wagner's great drama, take up the sword and proceed to fight the dragon.'

"Section 5370 Revised Statutes of the United States reads as follows:

" 'Every person who, upon the high seas, or in any open roadstead, or in any haven or basin, or bay, or in any river where the sea ebbs and flows, commits the crime of robbery in or upon any vessel, or upon any ship's company of any vessel, or the lading thereof is a pirate, and shall suffer death.'

"THE ONLY EFFECTUAL REMEDY TO CURE EXISTING COMMERCIAL EVILS IS GOVERNMENT OWNERSHIP OF RAILROADS, PURCHASED ON THE CREDIT OF THE PEOPLE, BOND ISSUES.

"With 12 years' patient trial of the interstate commerce act and nine years of the Federal anti-trust act this seems to be the only effectual remedy left, for gross freight discriminations and rebates continue to date, and we have not only an epidemic, but a plethora of trusts.

"Why should not the people own the railroads instead of being owned and controlled by an autocratic, arbitrary few, and get from these bandit chiefs and robber barons their properties back, their several rights of eminent domain, the basis of the railways, which were parted with only in trust for the public use for guaranteed equality in transportation rates and privileges, and now so ignored and ruthlessly disregarded, and by which these men dictate the terms and levy their tributory exactions as they see fit on the entire commerce of this country through these high rate, ironclad tariff sheets, which must be complied with or no one can ship?

"If the railroads were purchased at their actual appraised worth, for value received, with all the barnacles scraped off—all fictitious and watered stocks—with the created government bonds of the people, or consols with no time limit of payment, same as Great

Britain, bearing 2 or 2½ per cent interest, present railroad freights could be reduced at least one-half and passenger rates not to exceed one cent a mile, and easily pay interest and all expenses, and set aside the necessary surplus for bond liquidation, if so desired, so that the greatest good shall accrue to the greatest number."

And you can get rid of this political bugbear, centralization, and all that. Just disfranchise the railroad employes. There are only about 800,000 of them, and there are 1,000,000 men today that do not vote. Then you would get rid of the political end of it.

Q. (By Mr. Kennedy.) Are you in favor of disfranchising the 800,000 employes of the railroads of this country? A. Yes; in order to take the question out of political power or influence.

Q. You would be in favor of disfranchising those 800,000 workingmen? A. Certainly I would; yes, of course. There would be plenty of voters left.

Q. (By Senator Kyle.) Do you not think that this proposed remedy would be absolutely impracticable? A. Why, if that is the best remedy, I think it is practicable. You can get plenty of men to take the position, and that will take it out of politics.

Q. (By Mr. Kennedy.) Do you think that they could get plenty of men today who would be willing to be disfranchised? A. Why certainly; why not?

Q. Do you know any man in the United States that would be in favor of it? A. I should say there would. Why not? The greatest good for the greatest number, you know. What harm is there in it.

Q. They are citizens of this country? A. How are the citizens of this District right here? They can't vote. The residents of this town can't vote.

(Reading:) "If the money already spent and to be spent in our more than useless foreign war had been expended in the purchase of railways for the relief of 70,000,000 of our own oppressed home subjects instead of foreigners, how much better it would have been. Under such a condition every citizen would be put on perfect footing as to equal transportation rates and privileges, with much higher prices to the producer, without increase in price to the consumer, for all the necessaries of life, because rebates and freight discriminations would be eliminated. The value of personal and realty holdings would also thus be greatly enhanced, and then there would actually come an era of that real, genuine prosperity so much desired by the American people, and not be exclusively monopolized in the interest of the selfish minor few. It is a deplorable and dangerous situation.

"IF THE PEOPLE CAN NOT GET JUSTICE AND ARE NOT SOON RELIEVED OF THE BURDENS AND CONSPIRACY OPPRESSIONS IMPOSED BY THE RAILROADS AND THE TRUSTS, IN GROSS VIOLATION OF THE LAWS OF THE LAND, MATTERS MAY ASSUME AN UGLY SHAPE.

"A century ago the American colonies, goaded to despair by the long continued injuries, insults and exactions, broke the fetters that had bound them for many years and appealing to the Supreme Judge of the world for the rectitude of their intentions, 'assumed amongst the powers of the earth the separate and equal station to which the laws of nature and of nature's God entitled them.' In that renowned Declaration of Independence our forefathers asserted 'that when a long train of abuses and usurpations, pursuing invariably the same object, evinces a design to reduce them under absolute despotism, it is their right, it is their duty, to throw off their oppressors and to provide new guards for future security.'

"The last resort is for the people to retake into their own hands the power that has been delegated and abused. Vigilance committees have more than once had a purifying influence. There may be conditions which will again render them a necessity. There is a limit to human forbearance. Has that limit yet been reached?

"I am free to assert that unless some drastic measures are soon taken to do justice for the people the end will come in an ugly shape. The colossal fortunes that have been piled up as a result of the advantages enjoyed by the few and denied to the many represent just that much money coined from the blood and sweat of the masses. I do not believe any system will be permitted to exist which allows one man to accumulate a fortune of $400,000,000 to $500,000,000, while millions of his fellow creatures are suffering for the bare necessities of life.

"Every great wrong upon the people can be traced back to the greed and selfishness of the men who have cornered the resources of the earth, who keep the 'corner' intact by reason of an illicit power bestowed upon them by corrupt officials, who for the time being constituted the state. These criminal monopolies would be impossible if officials who administer the laws performed their sworn duty to the people. But they persistently refuse to do this. Men may impoverish themselves in an effort to secure rights which the constitution gives to them, but for want of an official execution those rights are denied them. This is a condition wholly incompatible with the principles upon which our government is founded, and should not continue. The people will soon throw off the yoke if relief does not soon come. They have a right to life and some of its enjoyments. They have the former, but only because it is necessary to the furtherance of the ends of the selfish rich. As to the enjoyments of life, look for them in the poverty of the common people and find them not. The people of this country are its sovereigns, and it is not only a crime, but a monstrous crime, to rob them so flagrantly and with so much persistence.

"The voice of genius has sent a trumpet in response to the cry of the oppressed. The dawn of emancipation should be near at hand. There is a rebellious spirit stirring within the people which may burst into a whirlwind of wrath.

" 'The man with the hoe,' whose terrible aspect Professor Markham has so powerfully portrayed, may yet hoe his row, throw off his burden and deliver his fellow man from the toils of the downtrodden and oppressed."

Q. (By Mr. Kennedy.) Do you expect or hope for any deliverance from "The man with the hoe?" A.

Their vote is just as good as anybody else's, and it is the vote that is going to regulate it.

Q. Do you expect intelligent deliverance from any evils from such a source as that? A. Do you not think that there are a great many men with a hoe that have as good intelligence as anybody?

Q. Not the one that is pictured by Professor Markham. A. Well, I do not know about that.

Q. (By Senator Kyle.) Have you any further statement that you desire to make? A. Mr. Archbold reads a letter from J. M. Culp, traffic manager of the Southern Railway Company, in which he emphatically denies that the Southern Railway Company has at any time given to the Standard Oil Company or any of its representatives "any lower rates of freight in the carriage of shipments made by that company over our rails, either by direct tariff, refund or otherwise than to other shippers of similar commodities." I am unable to give a specific case of freight discrimination over this line in favor of the Standard Oil trust, but will answer Culp's specific denial in a more general and comprehensive form by reference to the letter of Receivers Cowen and Murray, in which they say that "within the territory north of the Ohio River and east of the Mississippi" the railroad carriers are making "illegal concessions through secret rates, drawbacks, rebates and other devices."

The Southern Railway Company is connected with and is a member of the following unlawful freight associations: The Louisville Freight Committee, the Southeastern Freight Association, the Southeastern Mississippi Valley Association, the Virginia Freight Traffic Association, the Southern Iron Committee and the Baltimore Freight Committee.

Through the Louisville Freight Committee and the Baltimore Freight Committee the Southern Railway Company is pooled with rail lines that cover the territory north of the Ohio and east of the Mississippi, such as the Pennsylvania Railroad Company, the Baltimore and Ohio Railroad Company, the Chesapeake and Ohio, the Big Four, the Illinois Central and others. Cowen and Murray say that these lines of road were in December last granting secret rates, drawbacks, rebates, etc. Then it stands to reason that the Southern Railway Company followed suit. If any kind of rebates in any shape or form are given, you can rest assured that the Standard Oil trust gets the lion's share, as fully exposed by me.

"PLEASE TURN ANOTHER SCREW."

This seems to me an opportune time to show this commission the original letter written by the Chess Carley Company—but I recall I have already shown you that.

Q. (By Mr. Farquhar.) In the investigation by the Bacon committee of congress in 1888, when that question was put, and you were present and gave testimony at the same time, Mr. Cowen presented this letter of the Chess Carley Company to Mr. Culp and Mr. Culp, under oath, gave testimony, as found in this volume here, and they also furnished at the same time the tariff that was published and in effect at that time, showing that there was no discrimination against you in any way whatever, and that there were equal rates all around the board. A. At that time; at that particular time?

Q. At that particular time; at that time you gave testimony here in respetc to this letter written by Hathaway? A. He testified that there was no discriminations?

Q. There was not any discrimination at all; the testimony showed the published sheet of the regular rate, and the road made an explantion of what was called "putting the screw on." A. Very lame; very lame explanation.

Q. But still it is sworn evidence; it is here? A. Why, here are lots of letters.

Q. Well, here is the letter here in evidence, too. A. Oh, yes; that is all right; that is all right.

Q. And there was the man subjected to cross examination at that time, and that stands out in entire antagonism to your evidence here today? A. Well, the people can believe Mr. Culp against me if they want to; that is all.

Q. Well, what is the commission to do? That is the question. Here is the congressional evidence before us; what are we to do? There ought to be a reference to this testimony here in the records in some way. I want to ask you another question, too; and that is in respect to the testimony that you heard at the same time offered by Mr. Carley himself, in his vindication of this thing, that he had never got a rate at that time discriminating in any way whatever, which is also sworn testimony of a reputable witness outside. A. Who is a reputatble witness? Do you call Carley a reputable witness?

Q. Well, you can not call him otherwise; the congressional committee took it. A. They can if they want to. I do not believe it.

Q. It is given in the Bacon report. A. I would not believe either of those men; that is my experience with them, you know; I would not believe either one of them.

Q. I merely desired to call your attention to it. A. That is all right.

Q. Because many of the exhibits are in sworn testimony. A. The people can take what they believe of that, and believe what they are a mind to. I am telling the truth absolutely, without the shadow of a doubt, by solid experience. There is not a question in regard to it whatever. There is not any question that they raised the rates on me 50 per cent within five days. I have had men tell me that they would shoot such a man as that. There is not language strong enough to express a man's disgust at the execution of our laws. How can any man excuse such men or have any belief in them I can't understand, that will do such outrageous things.

Q. (By Mr. Clarke.) Do you recommend shooting as a remedy? A. I think it will come to something of that kind if you can not get relief. What did our colonists do over in Boston? They threw the tea overboard, did they not, because of oppression? We are just as much oppressed today as they were, and more so.

UNLAWFUL ASSOCIATIONS.

The Baltimore and Ohio Railroad Company are members of the following unlawful associations. I want to say this because the Cowen and Murray letter has been put in here, and Mr. Cowen has been here on the witness stand and explained it; and I want to show that they are members of what I call unlawful associations in keeping up rates. The Baltimore and Ohio Railroad Company by the official railway guide which I put in here, the best evidence in the world, are members of the Chicago Freight Committee, the Chicago Railroad Association, Eastern Railroad Association, Middle States Freight Association, Trunk Line Association, Western Pennsylvania and Eastern Ohio Railway Traffic Assocaition, Wheeling Freight Committee, Baltimore Freight Committee, General Managers' Association of Chicago, Mansfield Freight Committee, Middle States Lumber Association, Ohio Coal Traffic Association, Sandusky Freight Committee.

I want to say right here that about every time a decision is rendered by the Supreme Court of the United States against any one of these associations the others change their names immediately; they are not incorporated, and they can change them very easy, so they can get rid of all their past unlawful acts.

RELATIONS BETWEEN RAILROADS AND THE STANDARD.

In the late reorganization of the Baltimore and Ohio Railroad Company within the last few months, Henry Clay Pierce, of St. Louis, president of the Waters-Pierce Oil Company, Standard Oil trust, is made a director.

Q. (By Mr. Farquhar.) Do you think that it is well enough for these persons that are large owners of stock, I mean Standard Oil stock, and all that, to make investments in all these other things; is it not natural for business men to do that? A. It looks rather suspicious, you know, when you come to see all these men going into railroads, these big shippers; it looks very suspicious. Mr. Archbold falsely asserts when he states that pipage rates were included in the rail rates on the Cleveland and Marietta railroad. The absolute truth is that this railroad charged me 35 cents a barrel on my petroleum shipments, while it only charged the Standard Oil trust 10 cents a barrel; confirmed by the receivers of the railroad, its counselor, ex-Judge Rapello, and by the decision of Judge Baxter. This difference or overcharge on my shipments was taken from the treasury of the railroad and paid over to the Standard Oil trust.

Phineas Pease, the receiver of this railroad, allowed the Standard Oil trust to lay its pipe lines, not only in the roadbed's right of way, but also across passenger bridges, to assist it to convey crude oil from the Macksburg oil fields to Parkersburg, W. Va., 35 miles, where the trust had a large refining plant, and by this means deprived the railroad of the Standard Oil transportation. In 1885 when I wanted to simply cross once with my pipe line under the tracks of this same road, which I had the legal right to do, in order to reach the Muskingum River and thence barge my oil to Marietta, I was confronted by a telegram from Pease to desist from laying my pipes thereunder. I did not obey. A competing pipe line from Parkersburg tried to reach the Macksburg oil fields, and was prevented from doing so by this same railroad. But the Standard Oil trust could get everything they wanted; no objection at all.

In November, 1887, seven or eight months after the interstate commerce act took effect, I proved before the interstate commerce commission that I was then paying more than four times as much freight as the Standard Oil trust on shipments of oil to Birmingham, Ala., where I had an agency. I paid 59 cents per 100 pounds on 400 pounds to the barrel, which was $2.36; the Standard Oil Company only paid 16 8-10 cents per 100 on 315 pounds of bulk oil, which amounted to 52 cents and 9 mills, as against my $2.36 The discrimination was 346 per cent.

ACCUSATIONS AGAINST THE WITNESS.

I want to say just a little in reply to what Mr. Archbold said about me here:

(Reading from a paper:) "In reply to Mr. Lockwood, Mr. Archbold dealt at length with the Matthews and Rice cases, which Mr. Lockwood had instanced to show, as he claimed, that the Standard Oil Company controlled the courts. Mr. Archbold claimed in effect that these suits had been brought to compel purchase. He asserted that in the Rice case Rice had tried to induce him to buy his plant at Marietta, Ohio, for $500,000, when it was not worth $25,000, and had agreed to see that prosecution in certain cases was stopped in case the deal was made, claiming that he had sufficient influence to accomplish this result. He expressed the opinion that Rice was employed as an agitator by the enemies of the Standard Company. Mr. Rice was present in the room, and it is understood will reply later."

I want to say right here that no man in this country has ever put up a dollar to aid me in any fight I have had with the Standard Oil trust or railroads of this country. The statement is false.

Q. (By Mr. A. L. Harris.) Did you ever offer to sell out for $500,000? A. I did. I will explain that. They offered me $250,000 in 1882; and negotiations were started again in 1886 or 1887, about the time I was trying to get some Standard Oil trust certificates, which I owned, transferred to my name. They refused to make the transfer. I want to read these extracts just a little before I do anything else. This is another account of Mr. Archbold's testimony.

"He dwelt particularly on the claim that Mr. Rice had been discriminated against by the railroads in the matter of rates, and that the Standard Oil Company had made the railroads divide with them the charge they had collected from Mr. Rice. Mr. Archbold admitted that their agent had received something like $250 in this way, but said the money had been refunded to the railroad on the advice of their lawyer.

"Mr. Archbold charged Mr. Rice with running his business not for the legitimate profits in it, but for the purpose of selling out to the Standard people at an immense profit."

Mr. Archbold also read to this commission certain

extracts from the testimony I gave last February at the Ohio investigation, with the avowed purpose of showing that I am a blackmailer. The ground of this accusation is that I asked less for my refining plant at an early date than subsequently, when I had increased the capacity of my plant to five times what it was at the time the lesser prices were given, and I had not included my producing properties. Now, just think of it, gentlemen; and Mr. Boyle reiterates it in his testimony.

In March last at the Ohio investigation they engineered a scheme to put Archbold forward to denounce me with great vehemence as a blackmailer, in order to divert public attention from the real questions at issue, and commenced at once their vicious attack on me at the fourth question. This charge of blackmail is only a continuation of their oft recited and only stock in trade against me for 18 years. In 1881, in their red lettered pamphlet entitled "Black Death," issued by the Standard Oil monopoly, a fac simile of mine, they charged me on the upper marginal part, page 2, with blackmail, and have kept up this tirade of abuse ever since, for the avowed purpose of prejudicing the public mind against me. Why is it that they still keep it up, not only through trust officials direct, but through their special mouth organ. the Oil City Derrick, although my refinery has not been running for 3½ years to interfere with their high priced oil? On page 3 they admit my oil refinery alone to be worth $50,000 in 1881. It is fair to presume that they would have paid me double this price at that early date, when so willing to state its worth publicly. How silly and ridiculous it is for these hundred million millionaires to charge me with blackmail, when they have robbed the stockholders of the railroads by dishonest and unlawful means, through freight discriminations, out of hundreds of millions of dollars, which has been paid by the public in higher priced oils, and of poorer quality. I will read from my evidence given at New York on March 21 last:

"Before J. Edgar Mills, New York—The Buckeye Pipe Line Company.

March 21, 1899, 10 a. m.

"Hearing resumed.

"Redirect examination by the attorney general.

"Q. Mr. Rice, there is another branch of the case, of the Buckeye Pipe Line case, that I will call your attention to briefly. There is a cause of action charging that the defendant company assisted the Standard Oil Company of Ohio in evading the decree, known as the decree of March 2, 1892, and, perhaps, anticipating your evidence now rather as rebuttal evidence from what has taken place in the contempt proceedings, I will call your attention to that part of the testimony, and will introduce it here at this time, in which it is said the charge of contempt was a case of blackmail on your part, if I understand the import of Mr. Archbold's testimony, and to that most particularly where he says that your plant was only worth $25,000. Will you now state for the court the history of that attempted settlement and the amount that was offered for your plant actually, and what it is worth? I refer to the proposition that was made. Give the history of that entire proposition.

"Mr. Kline. I note an objection to the question not only as leading and suggestive, but as irrelevant and incompetent.

"A. The charge that Mr. Archbold has made against me as being a blackmailer because of any interest that I may have taken in the proceedings against the Standard Oil Company of Ohio; or in these proceedings, is a malicious statement and false; there is not a word of truth in it whatsoever in that regard, in that respect. In 1882, Mr. B. F. Squire, the present secretary of the Standard Oil Company of Ohio, came to me at Asbury Park, where I was stopping with my wife, and offered me $250,000 for my oil properties, including the producing properties and the refining plant. This I testified to before Judge O'Brien, of this city, in 1888, in proceedings that I brought against the trustees of the Standard Oil trust to get transferred an original trust certificate standing in another man's name into my name. Mr. Archbold was present at the proceedings and heard what I testified to and made no objections, nor was it denied. He at the same time went onto the stand and testified that my plant was not worth to exceed $25,000 or $30,000. He also produced an expert to say that it was not worth over $25,000. At this same time that I testified and at which Mr. Archbold was present—in the early spring of 1887, some four or five months previous to the proposition to which he alluded and which I will subsequently allude to—I offered my plant to him through Mr. Orvis, to Mr. Archbold, for the sum of $125,000, and $25,000 a year for five years. In 1886 it is true that I did submit a proposition to him to take for my producing properties and refining plant— the whole oil business that I had—the sum of $250,000, and $50,000 a year for five years. He considered the proposition, and wrote me two letters, of which I would like to submit here the copies of them, because they are very short.

"Mr. Kline. I note an objection to the copies.

"Q. Have you the means of getting the originals? A. have not the originals in my possession, but I will swear that these are copies.

"Q. Will you read the copies into the records?

"Mr. Kline. I note an objection.

"A. (Reading from paper:) '26 Broadway, New York, November 17,. 1886. George Rice, Marietta, Ohio. Dear Sir: I write to advise you that I have not lost sight of our recent interview, but there has been unavoidable delay in gathering information which we desire on the subject. We now expect to have this information in a week or so, and will then again communicate with you. Believe me, very truly yours, John D. Archbold.' The second letter: Dated, 'Standard Oil Trust, 26 Broadway, New York, December 13, 1886. George Rice, Marietta, Ohio. Dear Sir: We have given further consideration to the subject of our recent interview and are prepared, if you so desire, to discuss it further with you. Awaiting your advice as to your wish in the matter, and, if favorable, the designation of a time when you will meet with us here, I remain, truly yours, John D. Archbold.'

I never replied to the letter or never called upon them.

Q. (By Mr. Phillips.) What was the price fixed or talked of at that time? A. $250,000 and $50,000 a year for five years. Now, here is another. (Reading:)

"Q. There is another term that you use that I don't quite understand. I wish you would be kind enough to elucidate it more clearly. What do you mean by a refinery and a producing plant? What is the difference? What does your property include that you say you were offered $250,000 for? A. The proposition I made to Mr. Archbold and to Mr. Squires both, was to include all the producing properties that I had, which was some 200 acres of fee simple oil land and from 150 to 200 barrels per day production, and also to include all the machinery and everything attached thereto used in the production, and also to include my refining plant and everything connected therewith, tank cars and pipe lines, and so on, and the good will of the business.

"Q. Where was that 200 acres of oil producing land that you say you owned in fee simple located? In the oil district? A. Yes, sir.

"Q. Already developed? A. Yes, sir.

"And has it been oil territory ever since? A. Yes, sir.

That is the end of the quotation. Now I will make some of my own remarks. My property was fully worth the amount I asked. The mercantile agency of R. G. Dun & Co. for several years made a rating of $1,000,000 on this same property. It seems ridiculous to answer all these statements, but as the charges have been made, under all the circumstances, I have done it. In 1884-85, and part of 1886, my business had largely increased by my persistent efforts, which was not agreeable to the Standard Oil trust; so they invoked the aid of Orland Smith, president, and R. M. Fraser, freight agent, of the Cincinnati, Washington and Baltimore Railroad Company, the initial line out of Marietta, so to advance my petroleum freights as to ruin my business, so that this noble and philanthropic trust could easily buy it up for old junk. To the disgrace of these two men they readily assented to the nefarious demand and on July 15, 1886, they did advance my freight rates from 43 to 162 per cent, and did not advance the rates at all to the Standard Oil trust. This had the effect to close up 1 out of 24 of my agencies, and shut me out of 39 towns in 73, within the brief space of five months. From that time on my profits were very much lessened by these unlawful freight discriminations, and by the constant attacks and savage cuts made by the Standard Oil trust upon my customers' goods I was forced to yield and quit the oil refining business in May, 1886, and my refinery has been idle since—rotting down. I will also read some extracts from the Ohio investigation, but before doing so, will state that my testimony in said case has been very materially changed by two very important alterations, and of the same particular figure twice repeated, by which it now appears in the official printed evidence that the negotiation for the sale of my properties was conducted in 1887, the very month that the Ohio contempt proceedings were brought, instead of the year 1887, as I testified. I also testified that the capacity of my refinery was 100,000 barrels per annum, which has been changed to 10,000.

I am reading now from the record of the Ohio investigation of the Standard Oil trust.

Q. (By Mr. Farquhar.) Is it not strange, don't you think, that Attorney General Monnett would have those changes made? Could it have been on purpose? A. I am saying that they have been changed. I am not charging any one. "I will go back to 1897," cross examination of me by Mr. Elliott, counsel for the Standard Oil Company, page 385. "I will go back to 1897" —it should be '87. If I said '97, it was a mistake. (Reading:)

"Q. I will go back to 1897. Did you say to Mr. Archbold in an interview, 'I believe it is better for the Standard Oil people to make a deal with me, and that by so doing parties will be deterred from encouraging a line of action against the Standard Oil Company, which others are about to do?'

"A. No, sir; I do not recall anything of the kind. I wish to explain right here when those suits were enforced in regard to the transfer of my five shares"—

This is very important. (Witness resuming reading.)

"Of trust certificates; they tried to produce evidence the Standard Oil people did, and it came forth in the trial of the transfer of these five shares of trust certificates in my own name. They brought forward two men for that purpose that proposed to swear that I had demanded from the Standard Oil trust people a large amount of money, and they were the only ones who could settle this matter, and Mr. Bartlett, my counsel —this was indicated to him that such kind of evidence was coming out—and he particularly questioned me before I went to the stand, before the matter came up, to know whether this could be true that he had heard. And I said, if they brought up any matter of that character it certainly would be a lie, it would not be true; could not see how they could back it up. He was considerably nervous over it, and I was myself. I did not know but what they had adopted some kind of plan to smirch my character, and when it came up Mr. Bartlett objected to any of this testimony going in, and the judge said: Mr. Bartlett we will allow this to go in and if they do not connect Mr. Rice with this matter it will all be thrown out.' They went on and brought up two agents, one I have known in the oil business, Hill was his name, and I forget the other man's name; and they went on the stand and testified that they had letters that were written pro and con with the Standard officials in which they said to them they could arrange a settlement between Mr. Rice and themselves; that they had the whole thing in their hand. I never knew a thing about it. I never heard a word about it, and they admitted that they had no conversation with me. They had taken up their report and it was written on Standard Oil paper, making those threats, and those letters were used against me before the chairman of the committee in congress to poison his mind against me. There was nothing in them. They were gotten up by these men themselves, and to show the truth of it the judge threw out that testimony and would not allow it to go in. It was all

a concocted story to smirch my character; that is what is the matter."

Now, I want to read you the letter and correspondence that passed. I want to say right here, I think this correspondence was engineered for the purpose of being used afterwards, as Solicitor Dodd did use it. Here are letters—without my knowledge parties wrote letters under the head of the Standard Oil trust, and I never knew a thing about it. It was let in temporarily while the case was on with the understanding that if they did not connect me with it it would be thrown out. It was thrown out, but Mr. Dodd used it against me before the congressional committee in 1888. Now, this is a letter which was written, that I did not know anything about, and I think it was concocted for the purpose by this man Hill.

Q. (By Senator Kyle.) Who is Hill? A. Edgar P. Hill, Nassau street, New York.

Q. A man whom you know? A. I knew him once in the oil business. He directs this letter to Mr. Cuthbert, an official of the Standard Oil Company. He says:

"Edgar P. Hill,

"Attorney and Counselor at Law,

93 Nassau Street, New York, March 20, 1888.

"My Dear Cuthbert: I am going to write you a very plain letter in regard to the matter of Rice and the Standard Oil Company. In my judgment the company is making a great mistake in not getting Rice out of their way. I know what I am writing about, and the necessity of Mr. Brewster's being put in possession of such facts as I shall give you some account is urgent. Can you consistently and properly, through Mr. Bushnell, have them reach Mr. Brewster? If you can without prejudice to your interest, I hope you will do so. If you can not say,so plainly, and reply to this letter as soon as you possibly can. I shall not call on Mr. Dodd again unless he sends for me. I don't think he appreciates the situation. But to the facts, of which you will see something in the papers before you are many days older.

"First. Mr. Rice owns certain shares of the Standard Oil Company stock. An alternative mandamus has or will be soon issued commanding the company to transfer that stock to George Rice, or show cause why it is not done. If the company transfers the stock, Mr. Rice will prove to be a more troublesome customer than he is now, unless he is settled with at once. If the company refuse to transfer the stock they will be compelled to, and its trouble will be greater. The company can not resist the court if it refuses.

"Second. Rice has been summoned before the interstate commerce commission and will be before that commission tomorrow or very soon, to answer the interrogatories already framed, the answers to which will be troublesome to the company, to speak within bounds. Those interrogatories had better remain unanswered.

"Third. Legal proceedings are about to be commenced against the two railroads having large contracts in the past, and at present, with the Standard Oil Company in violation of the interstate commerce law for a forfeiture of their charters.

"Fourth. A law has been framed and will soon be introduced in congress giving Mr. Rice the authority to bring suits in any state against railroads that have made contracts with the Standard Oil Company discriminating against Rice and to his prejudice.

"Fifth. It is useless for the company to try to make a settlement with Rice through other parties. It must be done with me or not at all. There are other matters I could call attention to, but this is sufficient for the present. I write as I have to you for the sole purpose of having these facts brought to the notice of Mr. Brewster, and for no other purpose. Could I have an interview with him I am sure it would be to the advantage of the company. Again, let me say that I do not want you to be prejudiced in the least in this matter and unless you can see your way clearly to do this, don't do it, but return this letter to me and that will be the end of it, so far as you are concerned. Please do not delay your answer.

Sincerely yours, EDGAR P. HILL.

"EDGAR P. HILL,

"ATTORNEY AND COUNSELOR AT LAW,

"93 *Nassau St., New York, March* 29, 1888.

"My Dear Cuthbert: I have your letter of the 26th instant, for which you have my thanks. I am very glad indeed that you sent my letter to Mr. B. and I infer that he or Mr. Brewster has it now, as you do not mention its having been returned to you. I shall be fully engaged today and tomorrow in another matter, and as soon as that is off my hands I shall ask Mr. Brewster for an interview, and I am confident that good will come to the company from it. I desire to have you understand that I am not acting and will not act in this matter in any spirit of hostility to the company, but on the contrary I desire to bring about a settlement between the company and Rice, and nothing else. I am the only person who has the handling of this matter, and the Standard Oil Company is simply wasting valuable time in trying to reach Rice through some one else. That this has been done I am very sure, but it has had and will not have the least encouragement. I shall endeavor to make myself understood by Mr. Brewster, and am not without hope of causing him to see matters as they are, and not as they are represented to be by others in whom he places confidence. Mr. Dodd hinted at blackmail on the part of Rice, but that is absurd on its face, as I only ask to be heard fairly in an endeavor to settle a matter between these parties now, and which will be more difficult the longer it is delayed. I can settle the matter in less than a week if a fair and accommodating spirit is shown on the other side. I am well pleased with the situation, and again thank you for the kind assistance you have rendered me.

"Sincerely yours, EDGAR P. HILL."

Now, then, Mr. Dodd a few months later writes a letter to the Hon. Henry Bacon, chairman of the committee on manufactures, giving him the substance of these letters. He says:

"To Hon. Henry Bacon,

"Committee on Manufactures:

"We offer the correspondence on behalf of George Rice with persons connected with the Standard Oil Company to show that he threatened to give troublesome evidence before this committee unless settlement was made with him, and parol evidence to show that the price demanded for settlement was $550,000.

"Yours, S. C. T. Dodd,

"July 12, 1888. Solicitor Standard Oil Trust."

These letters and all the evidence pertaining thereto had been thrown out by the court and he used it afterwards.

Q. (By Mr. Phillips.) Did Mr. Dodd know that it had been thrown out? A. Certainly he knew; no question about it. You know it is ridiculous and outrageous to have to answer all that, but the charges have been made against me and I think I ought to answer them here.

Q. (By Mr. Jenks.) You never yourself had any communication with Mr. Hill at all? A. No, sir; not a particle.

Q. (By Mr. Farquhar.) Was Hill a broker in New York? A. No, sir; a lawyer. Now, gentlemen, here is a pamphlet that is issued by the great Standard Oil trust. I issued a pamphlet called "Black Death." It was in the papers a good deal at the time. That is my original pamphlet, and the Standard Oil trust issued that kind of a pamphlet with all the vacant places filled up with that scurrilous stuff against me. It is in exact size, same print, same paper, and everything, with the margins filled with a lot of scurrilous matter printed in red ink, and I think it might be well to read it, which will not take long, to show what kind of people they are.

Q. (By Senator Kyle.) Did you attack them in your pamphlet? A. Yes, certainly.

Q. This is in the shape of a rebuttal? A. Yes; I suppose so. Now, they have admitted this, you know, in a suit I had. They have admitted this pamphlet with all this stuff. They say: "If the Standard Oil Company pay George Rice $250,000 for his refinery, worth $50,000, can they sell oil any cheaper, or serve the public any better than they do now?" But on the front part they say: "Common sense pricks this hullabaloo." "Such missionaries as George Rice work mostly for George Rice." "Buy the best and cheapest goods of the agents of the Standard Oil Company." "The black border on the first page means blackmail by George Rice." This is issued by the great Standard Oil trust, a great philanthropic institution, which is worth several hundred million dollars, you know, and they say at the bottom of the second page: "Buy the 'Standard' goods." "If George Rice's goods are no better than his pamphlet, you don't want them." "His pamphlet boiled down simply means 'sour grapes.'"

[Other similar quotations in pamphlet.]

They acknowledged this as their property; that they published it.

It is generally known in the oil region that the Oil City Derrick is the organ of the Standard Oil trust, because they do not publish anything against them. It is all against anybody that attacks the Standard Oil trust.

Q. (By Mr. Phillips.) Is it the habit of the Oil City Derrick to attack independent producers? A. Yes.

Q. Producers engaged in opposition refineries. A. Yes; that is what it does. It attacks everybody that is in opposition to the Standard Oil trust.

Q. Did you ever know of its attacking any member of the Standard trust? A. I never did. I never knew of its attacking anybody in the Standard Oil trust or that has anything to do with the Standard Oil trust. It is known as an organ under the Standard Oil trust throughout the oil region.

Q. You have made sufficient reply to all these matters? A. I suppose I have. I wanted to reply to these things. I don't like this business, but these things have to be answered.

Q. Do you know what the dividends of the Standard Oil Company have been since its organization? A. Why, say $170,000,000 since 1892, and the 10 years previous would be $100,000,000—about $270,000,000.

Q. What is the capital stock sold at? A. It sold in May at 500 on a par of 100.

Q. What would that make the total? A. Half a billion dollars.

Q. Do you know anything about the surplus? A. No, I do not. They do not make a statement to anybody.

GOVERNMENT OWNERSHIP OF RAILROADS.

Q. (By Mr. Clarke.) I would like to ask Mr. Rice if he has any further remedy to recommend to this commission than government ownership of railroads? A. I do not believe I have, Mr. Clarke. The experience of the past 12 years of the interstate commerce law shows that the penalty clause of $5,000 and two years in the penitentiary for each and every offense is absolutely without effect. I think more drastic measures must be used; and I do not see how freight discrimination can be remedied except by government ownership of railroads.

Q. In your pamphlet you make some allusions to the ease with which certain people can control legislation, especially in the state of New Jersey? A. Yes; I think that by the centralizing of trusts and combinations in one state, it is much easier to control that state in the way of legislation.

Q. Do you not recognize that there would be great danger that if railroads were owned and controlled by the government there would be great abuses, political abuses incident to it? A. No; I do not. For this reason, that I do not know of any instances now of any particular account that any department of the government is run dishonestly. That is to say, every man is getting his equal just deserts. That is the way I understand it. You do not hear of any complaints that the government is being robbed, excepting, of course, occasionally; now and then. In a general way the departments of the government are run honestly, fairly and squarely.

Q. We have heard from you several times today that you do not think the government officials are performing their duty? A. I do not.

Q. Would they be any more likely to do it if they had control of the railroads? A. Yes, they would. If they did not do their duty quite so well, they would have no freight discrimination, which I can tell you would be of great advantage to the people of the country; but as I understand it all government employes do their duty generally.

Q. Do you not think that discriimnations can be provided against effectively without government ownership of railroads? A. No; I do not know how it can be. They pay no attention to this severe penalty clause, and as everything shows, discriminations are about as bad to day as ever; but of course they are more covered up, and you do not get onto the worst of it. There was an expert that was employed on the books of the Atchison, Topeka and Santa Fe when that $7,000,000 of rebates was discovered five years ago. This railroad expert told a friend of mine—this expert who was put on the books—that he was getting into the "meat" of it, and discovering this discrimination, and he had got onto it through a certain key, of a pencil mark on the books, which turned out to be the secret. He was just getting into it when he was shut off, after he had discovered rebates to the extent of $7,000,000; and he said he thought more could have been discovered, if he had had time to work it out. That was told to me by friends on whom I can rely—that the expert told him, and I have no doubt that it is so.

Have I said enough in regard to the existence of the Standard Oil trust? I pretend to say that the Standard Oil trust is growing stronger all the time and that said trust is not dissolved by any means; simply passing resolutions to dissolve it does not dissolve it by any means. I did not know whether I made that plain enough.

Mr. A. L. Harris. I think so.

Washington, D. C., Wednesday, December 13, 1899.

TESTIMONY OF MR. HOWARD PAGE.

Vice President of the Union Tank Line Company.

The commission met at 10.45 a. m., Chairman Kyle presiding.

Mr. Howard Page, of New York city, vice president of the Union Tank Line Company, was introduced and, being duly sworn, testified as follows:

Q. (By Senator Kyle.) State your full name, address and business. A. Howard Page, New York city. I am vice president of the Union Tank Line Company, which is a company that owns the cars in which the Standard Oil Company makes its shipments over the various railroads in the United States. I began in the business with Chess, Carley & Co. in 1878, and continued with that firm until it became the corporation of the Chess-Carley Company, which was in 1881. The Chess-Carley Company was succeeded by the Standard Oil Company of Kentucky, about 1886. Chess, Carley & Co. and the Chess-Carley Company were under the direct control and management of Mr. F. D. Carley, who was the resident partner and manager at Louisville.

Q. (By Mr. Jenks.) At what time did you go into the employ of the Standard Oil Company? A. The Standard Oil Company of Kentucky was formed about 1886. I was with that company until I came to New York, in 1889, to take a position with the Standard Oil Company of New York. I have been with that company and the Union Tank Line Company since that time.

Q. Have you been immediately connected with the transportation business ever since coming to New York? A. I have, and prior to that time I was in charge of the traffic matters of the Standard Oil Company of Kentucky, and also of the Chess-Carley Company, when I was in Lousiville, and also familiar with that part of the business when I was with Chess, Carley & Co.

Q. And in New York with the Standard Oil Company, you were especially in charge of their transportation business? A. As vice president of the Union Tank Line Company, which, as I have stated, is the company that owns all the tank cars in which the Standard Oil Comypany makes its shipments throughout the United States, I was familiar with the transportation business of the company throughout the United States.

Q. How long have you held your present position as vice president of the Union Tank Line Company? A. Since the formation of the company in 1891.

Q. I understand that you have a general statement that you wish to make? A. I have a memorandum or answer that I wish to offer to the allegations and charges made by Mr. Rice before the commission in regard to transportation and freight arrangements, which he alleges that we have as against himself and other shippers. I have gone in detail into his testimony and will now answer the points which I have picked out.

Mr. A. L. Harris. Mr. Chairman, I do not know but there is a possibility of saving time. As I understand it, there is nothing that the commission desires before the time of the interstate commerce law. I think it is conceded that there were rebates and discriminations previous to that time. Mr. Archbold, when he was on the stand, said that there had been nothing since that time; Mr. Rice claims there has. Will it not be enough if Mr. Page answers the charges made by Mr. Rice regarding discriminations since 1887?

The Witness. I would say, in answer to that, that there are some charges relating to the time before the interstate commerce law, which Mr. Rice has made and reiterated and advertised so frequently that they have come to be believed, and which I think I can answer very satisfactorily, and which we should like to have the opportunity of answering.

Mr. A. L. Harris. There is one particularly that you have in mind, I think, that we have no objection to, and that is "putting another on." You may make any answer in regard to that.

The Witness. That is the principal one, and it will

not take as much time to answer it, Mr. Harris, as we have taken now.

Mr. A. L. Harris. I wanted to prevent covering the entire ground previous to 1887, when there is no dispute particularly between the Standard Oil Company and Mr. Rice. It is conceded that there were a number of favors granted. But since that time, as I understand, the Standard Oil Company claims to have lived strictly up to the law.

The Witness. Absolutely.

Mr. Phillips. I think, in opposition to my friend, Mr. Harris, that it is entirely competent for the witness to go over the whole ground covered by Mr. Rice. Mr. Rice stated facts; and he has a right, it seems to me, and it is proper, that he should cover the ground covered by Mr. Rice without regard to dates. Of course, what has transpired since the interstate commerce law was enacted is more important to this commission; but if Mr. Rice has made any statements in regard to discriminations before that time, I think the witness should have the privilege and the unlimited privilege of replying to such statements.

Senator Kyle. It strikes me, gentlemen, that inasmuch as Mr. Archbold admits discriminations prior to 1877——

The Witness (interrupting). Admits that we got as low rates as we could prior to 1887.

Q. That there were rebates given prior to that time? A. Yes.

Senator Kyle. That there is no issue except as to some special discriminations against Mr. Rice that he complained about, and as to this Chess-Carley business in Kentucky.

The Witness. That is all; and as I was there at the time and was familiar with it, I think it is only fair to the company that I should be allowed to make a statement.

NO PAYMENT FOR A COPY OF A TRUST AGREEMENT.

Mr. Rice charges that the cotton seed oil trust paid the Standard Oil Company $250,000 for a copy of its trust agreement. We deny this absolutely as to any amount; in other words, we did not receive a dollar.

ALLEGED FAVORITISM IN THE PURCHASE OF LUBRICATING OILS.

Mr. Rice claims that the railroads paid the Galena Oil Company very high prices for its oils, and this forms a kind of freight discrimination in favor of the Standard Oil Company. Mr. Archbold denied it, and I deny it again. The facts are that the trade secured by the Galena Oil Company is because of the superior and uniform quality of its oils as compared with the ordinary oils on the market. As to the prices paid for the Galena oils as compared with others, the Galena Oil Company sells its oils to railroads under an agreement by which the Galena Oil Company always guarantees that the cost shall not exceed the cost of oils that the railroad has used before, and generally guarantees a reduction. This guarantee is in the form of a certain cost per train per mile for the different equipments which the railroad runs over its rails. That is, the cost per train mile of engines, freight cars, and passenger cars is found from the railroad's own books, and then the Galena Oil Company guarantees that railroad, after finding the cost of the use of the other oils, that the cost of using Galena oils will be less, and never more, than by using the other oils.

Q. (By Mr. Clarke.) You refer to lubricating oils entirely? A. Lubricating oils entirely, and signal oils.

Q. Signal oils. A. The result of this has been that there has been a great saving in the cost of the lubrication of railroads, and a growing trade to the Galena Oil Company. This saving is produced by the fact that the Galena oil will do more work for the same money than any other oils, and experience has shown that that result has been obtained, and the guarantee is made good. And as regards the amount of money that the railroads pay to the Galena Oil Company for the use of its oils as compared with the cost of the ordinary oils on the market, is shown to be less.

Q. (By Mr. Farquhar.) Has it not been customary for the last thirty years to demand these tests of all persons that present oils for railroad use? Has it not been the custom of the oil trade for thirty years to do as the Galena does? I do not think any other company has gone into it as a science as the Galena Company has done.

Q. Not as to uniformity? A. Nor do I know that they have ever guaranteed the cost of a train mile for a year or a series of years, as the Galena company does. It is immaterial to a railroad if a gallon of oil cost 10 cents or 5 cents, if the 10-cent oil will do work for three miles that the 5-cent oil will only do for one mile. That is simply the result of the use of the Galena oils. The Galena oils, although they have but one price, and a uniform price, and a higher price than the cheaper grades of oil, will do more work, and the railroad will pay less money in a year by the use of those oils than they pay by the use of the cheaper oils; and they are so guaranteed.

Q. (By Mr. Smith.) Has that fact ever been demonstrated? A. Absolutely. The demonstration is proved just by what Mr. Rice claims—that the result has been that 95 per cent—I do not say it is 95 per cent, but I do say the Galena Oil Company has secured the large and growing trade with the railroads; and it could not have done so had not the oils been superior and the results been obtained that they have shown.

Q. You say this large trade with the railroads is due to the superiority of that oil and not to influence brought to bear by the Standard Oil Company? A. Absolutely; the superiority of the oils and the economy that they have given to the lines themselves.

Q. (By Mr. Jenks.) You make the general statement, then, that in no case does the Standard Oil Company receive a higher cost of lubrication from any of the railroads than would be paid to other companies for bad oils? A. Per mile?

Q. Per mile? A. Absolutely.

Q. You do not deny that the Galena Oil Company does receive more per gallon than might be given to some of the other companies? A. For the cheaper grades of oil.

Q. But in no case do they receive more for the same grade of oil than would be given to the other companies? A. I have tried to make myself clear on that. The guaranty of the Galena Oil Company is to the effect that by using their oils the cost per train mile of the various equipments of the railroads is guaranteed to be no more, and is generally guaranteed to be less, than with the use of other oils.

Q. That applies generally to all the railroads to which it is sold? A. Yes; absolutely to all the railroads.

GALENA COMPANY'S PRICES UNIFORM—ITS BUSINESS MULTIPLIED BY TEN IN ELEVEN YEARS.

Q. (By Mr. Smyth.) Do I understand you to say that there is a uniform price for this oil? A. The price is the same to every railroad in the United States.

Q. Regardless of quantity? A. Regardless of quantity. Of course one railroad may use very much more oil than another, but the price per gallon is the same to all railroads all over the United States. The guaranty is not the same, because in running over one railroad, for instance, like the Northern Pacific, or the transcontinental line, the cost is necessarily greater than in running over a railroad like the Pennsylvania or the New York Central; but the guaranty is that the cost, whatever it has been, over the road with which they make the contract, shall not be greater, and generally that it shall be less, than the former cost in the use of the particular oils.

Q. (By Mr. Phillips.) Do you claim that there is no refiner or person engaged in the manufacture of lubricating oil that can make oil equal to the Galena oil? A. I can not answer that; I can only say what the result of the Galena Company's oil and its business has been.

Q. Yes; but you spoke of their guaranteeing a superior quality of oil? A. I did not say guaranteeing a superior quality; I said they guaranteed their cost.

Q. And above the cheaper oils? A. Yes.

Q. The inference would be probably that all others made inferior or cheaper oils than the Galena. A. I did not say.

Q. You did not say it in so many words. A. I said that the result of the use of the Galena oils had been a saving to the railroads in the cost, and that they were justified in guaranteeing that cost by the fact that the Galena oils did better work for the same money than the cheaper grades of oil that were offered on the market.

Q. Did or did not the monopoly of the lubricating oil business, so far as the railroads are concerned, grow up during the time when the rebate system was in vogue everywhere? A. Absolutely not. For ten years back, during which time the Standard Oil Company has not received a dollar in rebates, the trade of the Galena Oil Company has grown tremendously, and I would say is probably ten times today what it was at the date of the passage of the interstate commerce law.

Q. Did they not get this monopoly of the lubricating business of the country prior to the interstate commerce act, though it has grown largely since? The railroads have increased by thousands and tens of thousands of miles since that day. A. I should think that I had already answered that by saying that today the trade of the Galena Oil Company is ten times what it was ten years ago, and in the last ten years we have not received a dollar in rebates; therefore, prior to the interstate commerce law, when we did receive lower rates of freight than the tariff, as all other shippers did, the trade of the Galena Oil Company was only one-tenth of what it is today.

Q. But still it was practically a monopoly of that business at that date? A. It was not. If they only had one-tenth of the business they have today, they can not have had a monopoly at that time.

Q. Did they not use your oil and other oils? Has not the use of lubricating oil been growing all the time? Was there or was there not any considerable amount of oil furnished by independent or outside people to railroads prior to the interstate commerce act? A. They sold the railroads then and they sell them now.

Q. No considerable amount to the railroads prior to that? A. Oh, yes; as far as my knowledge goes, they did, and they try to now and they do now.

Q. (By Mr. Farquhar.) Is it not a fact that the Galena Company, before it ever came into the Standard, established a lubricating business? A. Yes.

Q. Is it not generally known and understood that the Galena is the best lubricant ever made in this country? Is it not the general reputation among railroad men and all others? A. Its success has certainly proved that.

GALENA COMPANY HAS NOT SOUGHT MANUFACTURING TRADE.

Q. (By Senator Kyle.) How does it commend itself to enterprises outside of railroad companies? A. The Galena Oil Company has made a specialty of the railroad and steamship trade; it does not try to sell the manufacturing and machine trade.

Q. It does not refuse to sell? A. No; it does not refuse to sell, and has also a large and growing trade abroad.

Q. Do not these other private corporations discover the merits of the Galena oil, and if it is cheaper, would not they find this merit out? A. They use those oils, but as I say, the Galena Company has made a specialty of the railroad and steamship business, and while that does still hold, and it is only too glad to sell the mills, it has not made a special branch of the business in that direction.

Q. I want to get the comparative merits of the Galena oil. If private enterprises are still using other brands outside of the Galena, there must be some merit in those, because all those institutions are determined to get and use the very best oil in their business. Economy dictates that. A. But the Galena oil is an oil that is compounded and made especially for the requirements of the railroads. The oil that is required for an engine and for the axles of a freight train is not necessarily the kind of oil that is required in machinery.

Q. The other companies, then, are not catering for that sort of trade; they are not making that kind of oil? (No answer.)

OIL SOLD ON LONG CONTRACTS—PRICES ABSOLUTELY UNIFORM.

Q. (By Mr. Jenks.) Where do you sell this Galena oil to mills, how do the prices quoted to the mills compare with the prices quoted to the railroads? A. Absolutely the same.

Q. Not lower? A. Absolutely the same; not lower.

Q. At what time did the Galena Oil Company go into the Standard Oil Company? A. I do not know.

Q. Does this fact that the Galena oils are sold to the railroads mostly on contract for a year explain the statement that has been made here at different times, that when independent dealers attempted to sell oil to local railroad officials, they were referred invariably to the higher officers of the railroad company? Your own officers also have testified that they had no knowledge of the price of oils to railroads because they themselves, the local managers, did not deal with the local officers. A. That is generally true, I believe, of the supplies used on railroads. The purchasing agent or local division agent of a railroad is not the man that buys for a large system of roads any article that is used to any large extent, and naturally the local man would not know the price of a contract, that would probably be made by the general manager for a series of years, covering the entire lubrication of a railroad.

Q. (By Mr. Farquhar.) All those articles are generally bought by contract by the year? A. The contracts are generally for from three to five years, simply because the results and the economies can not always be demonstrated in one year.

Q. (By Senator Kyle.) They have no schedule prices on those? A. They have an absolute schedule price per gallon.

Q. For from three to five years? A. From three to five years; and they guarantee the cost per train mile of the various equipments run, based on the cost that has been shown before by that same railroad in the use of ordinary oil.

Q. And that price is quoted to all consumers? A. Yes.

Q. Whether railroads or not? A. Yes.

Q. And yet nobody knows it because it is referred to the head officers of the road or of the company? A. I do not think that is a fair inference. What Mr. Jenks said was that the local man of the railroad does not always know what the prices are that the railroad is paying to the Galena Oil Company for the oils. That is not saying that the Galena Company does not quote these prices to the customer that wants the oil.

Q. They make the same prices to a railroad for a five-year contract that they would for a barrel of oil to a private consumer? A. I know that the price is the same for a barrel of oil on every railroad as outside.

Q. (By Mr. Smyth.) Can you give the price of the oil per barrel? A. I do not know, Mr. Smyth. I know it has a large trade and a growing trade.

DESPEAUX VS. PENNSYLVANIA RAILROAD COMPANY.

In regard to Mr. Newlin's letter to George Rice, alleging freight discriminations by the Pennsylvania Railroad in favor of the Standard Oil Company, as compared with other shippers. I beg to hand you a letter from Solicitor Dodd, addressed to the commission, attached to which are some letters from the attorneys of the railroad in reference to that matter. I will say briefly that Mr. Newlin's deductions, as presented in his letter to Mr. Rice, were the same as argued by him before the United States court at Philadelphia, and the court dismissed the case. The facts in the case, boiled down, are simply that the Standard Oil Company paid exactly the same rate of freight as all other shippers over the Pennsylvania Railroad from and to the various points named in Mr. Newlin's letter, but on such oil as was carried partly by pipe line and partly by railroad, the pipe line was allowed a share of the through rate the same as the railroad would allow any other connection. The pipe line is a common carrier under the laws of Pennsylvania, and on all oil that is gathered in the oil fields and piped toward the seaboard and delivered to the Pennsylvania Railroad as it was at Hamilton, the rate was the same as the through railroad rate, and the pipe line got a share of that rate for its haul as the Pennsylvania Railroad got a share for its haul. The legal and the full explanation is in this letter from Mr. Dodd and the attorneys of the Pennsylvania Railroad, which I shall present as an exhibit.

I.

New York, December 7, 1899.

The United States Industrial Commission.

Dear Sirs: James W. M. Newlin, in his letter to George Rice, which was given in evidence before the United States Industrial Commission, made two specific allegations:

First. That during the years 1881, 1882 and 1883, Fennaille Depeaux paid the Pennsylvania Railroad Company 48 cents per barrel for carriage of oil, all rail, from Foxburg to Communipaw, and at the same time, between the same points, the railroad company carried oil for the Standard Oil Company at a reduction of 22½ cents per barrel.

Second. That the Pennsylvania Railroad Company carried oil from McCalmont and other points to Communipaw, charging Fennaille & Depeaux 33 cents per barrel, and at the same time, between the same points, carried oil for the Standard Oil Company of New York for 19.875 cents per barrel.

He further claims that these facts were proven in the case of Fennaille & Despeaux vs. The Pennsylvania Railroad Company.

We desire to make the most specific denial of these statements:

First. That it is not true that oil was so carried for the Standard Oil Company; and

Second. It is not true that any evidence of such fact was given in the case of Fennaille & Despeaux vs. Pennsylvania Railroad Company or any other case, nor was any evidence given, written or oral, from which any sane man could infer such a state of facts. On the contrary, the evidence given was positive that at the dates mentioned the Standard Oil Company paid the same rates on freight as other shippers and received no drawbacks or preferences.

Mr. Newlin, after stating these facts were proven in said case, refers to the specific evidence, which was an agreement between the Pennsylvania Railroad Company and the National Transit Company, dated May 6, 1881. I presume a copy of this agreement was handed to the commission, and it is only necessary to say that the most astute and suspicious mind could not distort the language of that agreement into a support of the allegations which Mr. Newlin bases upon it, and Mr. Newlin should have been more cautious in making such allegation, as he had already been heard in the United States court at Philadelphia on his construction of this agreement, and after argument the case was dismissed by the court for want of any proof of discrimination.

Mr. Newlin claims the discrimination lurks in sections 4 and 8 of the said agreement. The agreement was a joint traffic agreement in regard to oil carried partly by pipe line and partly by rail, the through pipe line at that time having been completed to a point near Milton, Pa. The fourth section is as follows:

"The through rates from the discharging points of the gathering pipes in the region to the destination of the oil, whether the same shall be shipped entirely by rail or by trunk pipe and rail, shall be fixed by the trunk line railroad companies, provided they can agree upon the same, and the transit company agrees to accept thereof as the share due to its through pipes, the proportiontions hereinafter fixed. The through pipe lines include only such lines as receive oil from the local or gathering pipes and do not include any part of said local gathering pipes."

By this section the railroad companies were authorized to make the through rate, and a distinction was drawn which has always been maintained between the local and gathering lines and the through pipe lines. With the local or gathering pipe lines and their charges for gathering oil, the railroad had no connection, except in the single event provided for in section 8. Charges for oil carried by the through lines to Milton and thence by rail were prorated between the pipe lines and railway as provided in section 7.

Section 8 is as follows

"Whenever the through rate from the exit point of gathering pipe shall be less than forty (40) cents per barrel, the local or gathering pipe shall be considered as entitled to a rate equivalent to only one fourth (¼) of the rate which shall be formed by the addition of the said through rate to the public rate which the local pipe charges, and one-half (½) of the difference between this one-fourth and the said public rate shall be considered as due and to be paid to the railroad company, but this difference shall never be such as to make the local pipe receive less than ten (10) cents per barrel.'"

The obvious intention of this so-called dangerous section is to take from the pipe line a certain portion of its charges and give it to the railroad when the through rate is less than 40 cents.

Referring to Mr. Newlin's figures, the first relates to a rate in excess of 40 cents, and he certainly could see, if he has eyes, that section 8 has no reference to such a case. The second table of Mr. Newlin's figures relates to a rate less than 40 cents, and if it referred to carrying oil by pipe line to Milton, or any point on the through lines, and thence by rail to seaboard, it would come within section 8, but it does not so refer. If the Standard had oil carried by rail from Foxburg or McCalmont, it was not affected by this agreement; if it had oil carried by pipe line to Milton and thence by rail to seaboard and the total through rate was 33 cents, it paid the railroads 33 cents and the railroads adjusted the charges with the pipe line company under section 8.

Further, Mr. Newlin's figures are based on a total misreading of section 8. This misreading consists in confounding "through rate from exit point of gathering pipe" and the "public rate which the local pipe charges."

In Mr. Newlin's first figures the through rate from exit point of gathering pipe is 48 cents. The public rate which the local pipe line charges is 20 cents. One-fourth of the sum of these rates is 17 cents.

Mr. Newlin says one-half of the difference between this 17 and 68 cents is the amount the Standard paid the railway company for freight. The contract does not say so. It says one-half of the difference between 17 cents and the "said public rate" shall be paid to the railroad. Referring back to see what "public rate" has been mentioned we find it is "the public rate which the local pipe charges." There is no other reference to "public rate' in the section.

The figures which Mr. Newlin injects instead of the "said public rate' are made up of the through rate from exit point of gathering pipe and the public rate which the local pipe line charges, or 68 cents, while "said public rate" is 20 cents, and one-half of the difference between 17 and 20 is 1½. Therefore, if he had made his figures correctly, he would have shown that the Standard only paid 1½ cents per barrel freight while others were paying 48 cents.

But such a reduction as that would have defeated his purpose.

Pursuing the investigation further, it will be found on Mr. Newlin's theory that "one-half of the difference between this one-fourth and the said public rate"fixed the amount the Standard paid for its freight. If the railroad charged others 60 cents per barrel, the Standard would pay nothing. But if others paid 33 cents per barrel, the Standard would pay 3.37½ cents, and the lower the rates to others the higher to the Standard.

All this is absurd, and the absurdity consists in the misreading and misapplication of the section. It has no reference whatever to the freight rates the Standard shall pay. They were fixed by the railroad without discrimination. When others paid 48 cents the Standard paid 48 cents, and when others paid 33 cents the Standard paid 33 cents, but if oil went part of the way to seaboard by pipe line, under this agreement, the pipe line was paid a pro rata proportion for its share of the transportation. To compensate the railroad for a low rate of freight, the pipe line company agreed to take something from the pipe rate which the local pipe line charged and pay it to the railroad. This only applied when the rate was less than 40 cents, and would increase as the railroad rate diminished below this point, but was "never to be such as to make the local pipe receive less than 10 cents per barrel."

Admit for argument that the Standard and the pipe lines are essentially the same, and what is the result? The Standard received from the railroad company a pro rata amount for its share of the transportation by pipe line, and to recompense the railway company for an exceedingly low rate for through freight, agreed to pay to the railroad company a portion of its local pipe line earnings. It may have been a rebate to the railroad; it certainly was not a rebate to the Standard.

Coming next to the agreement of May 6, 1881, a case of payment to the railroad company is much more clearly shown. The pipe line was then completed to the seaboard. It could not have reached that point without the consent of the railway company, as no free pipe line law then existed in the State of New Jersey. It was still necessary to have a traffic contract with the railroad and to deliver oil to the railroad at different points on the through line, that point being Milton, as before, for oil destined for Philadelphia. In addition to agreeing to prorata rates for oil carried partly by pipe and partly by rail, it was further agreed that if the railroad company did not move 26 per cent of the oil, the Transit Company should pay it the deficiency.

Settlements were made with the railroad company, and one of the settlements is referred to in Mr. Newlin's letter, that of September 30, 1884, which shows a payment to the railroad company for such deficiency, amounting to $10,722.22.

Many such settlements were put in evidence, all of them showing monthly payments of large amount to the railroad company. None of these were payments for freight, but payments to the railroad company for deficiency in the amount it carried as specified in the agreement.

Attempting to distort a payment of this kind to the railroad company as a discrimination in favor of the Standard Oil Company ceases to be absurd—it is malicious. S. C. Dodd.

Law offices of Geo. Tucker Bispham, A. H. Winterstein, John Hampton Barnes. Sharswood Brinton, Girard Building, Broad and Chestnut streets, Philadelphia. Despeaux vs. P. R. R.

November 29, 1899.

S. C. T. Dodd, Esq.,
Standard Oil Company, 26 Broadway, New York.

Dear Sir: I did not find Mr. Sellers in when I called today, and am now writing without consultation with him. I will, however, supplement this letter by any suggestions which Mr. Sellers may have to make.

Mr. Newlin's claim, to which you refer, is based not upon any oral testimony given at the trial, but entirely upon his construction of the fourth and eighth paragraphs of the agreement of May 6, 1881. This agreement was between the National Transit Company and the railroad company, and it was in our view of the matter simply a traffic agreement between two transporting companies. Mr. Newlin's position, however, was that the National Transit Company was in reality the Standard Oil Company, which owned a large controlling interest in its stock, and his argument is based upon that assumption, and his contention is that any diminution or abatement of the charges of the railroad company under this contract inured to the advantage of the Standard Oil Company and was to be treated as if it were an allowance or rebate to the latter company.

He arrives at the figures which you give in your letter in this manner:

He considers the fourth and eighth paragraphs in the agreement together, and he contends that the provisions as to through rate contained in the latter paragraph, when read in connection with the former, are applicable to through rates, whether the same are greater or less than 40 cents per barrel from Foxburg to Communipaw. Assuming this to be so, Mr. Newlin's calculation is as follows:

The eighth paragraph provides:

"Whenever the through rate from the exit point of gathering pipe shall be less than 40 cents per barrel, the local or gathering pipe shall be considered as entitled to a rate equivalent to only one-fourth of the rate which shall be formed by the addition of the said through rate to the public rate which the local pipe charges, and one-half of the difference between this one-fourth and the said public rate shall be considered as due and to be paid to the railroad company, but this difference shall never be such as to make the local pipe receive less than ten cents per barrel."

The through rate by rail was 48 cents.

The public rate of the local or gathering pipe line was 20 cents.

The calculation, therefore, would be thus: 48 plus 20 equals 68; one-fourth of 68 equals 17; one-half of 51 equals 25½; 48 minus 25½ equals 22½.

The above calculation is the basis on which Mr. Newlin's allegation, in his letter to Mr. Rice, to which you refer, is based.

The 19.875 cents per barrel is arrived at by Mr. Newlin in this way, the calculation being at the rate of 33 cents per barrel from McCalmont to Communipaw on the same principle as above. Thus: 33 plus 20 equals 53; one-fourth of 53 equals 13.25; one-fourth of 39.75 equals 19.875.

This is the way in which he gets his figures showing, as he says, that the Standard Oil Company was charged that amount only for transportation.

In addition to the obvious replies that the arrangement was a traffic arrangement, and that such an agreement can not be construed as a rebate to a shipper simply because that shipper happens to be a stockholder, and even a controlling stockholder, in one of the transportation companies, there are other answers based upon the language itself of paragraphs 4 and 8. The assumption that the provision in paragraph 8, when the rate is less than 40 cents, shall be applicable to paragraph 4, which refers to a rate above 40 cents, would seem to be without warrant. Moreover, the "one-half of the difference between this one-fourth and the said public rate" refers to the difference between the said one-fourth (made up of the through rate by rail to the public rate by local pipe charges) and the rate of local pipe charge—that is, 20 cents. In other words, instead of taking one-half of 51 (see above calculation), there should be taken one-half of 3, being 20 less 17, or 1½.

Whether I am right in this last calculation or not, it is nevertheless true, as I have stated above, that there was no evidence whatever, oral or written, which was introduced at the trial, which justifies Mr. Newlin's assertion; but that assertion rests altogether upon his forced construction if the fourth and eighth paragraphs of the agreement of 1881, which I have endeavored to explain.

If the foregoing is not sufficiently clear to you, let me know and I will endeavor to make it plain.

Truly yours,

GEO. TUCKER BISPHAM.

Attached thereto is the following:

Law offices of Geo Tucker Bispham, A. H. Wintersteen, John Hampton Barnes, Sharswood Brinton. Girard Building, Broad and Chestnut streets, Philadelphia. Despeaux vs. P. R. R.

December 6, 1899.

S. C. T. Dodd, Esq.,
26 Broadway, New York.

Dear Sir: I have your favor of the 5th instant.

After the plaintiff closed his evidence a motion for a nonsuit was made and fully argued by Mr. Sellers and myself on the part of the defendant and by Mr. Newlin for the plaintiff. The motion for a nonsuit was granted. Mr. Newlin made a motion to take it off, and this was subsequently argued and the motion denied. The nonsuit therefore stands. Mr. Newlin has taken an appeal to the circuit court of appeals, but there has been some difficulty about settling a bill of exceptions. When this is finally adjusted I will advise you. Meanwhile the above will give you the present condition of affairs.

Truly yours,

GEORGE TUCKER BISPHAM.

Q. (By Mr. Jenks.) Have those pipe line and railway companies changed their rates on oil since 1894? A. You go back too far for me. I can say that the rate for oil of the Pennsylvania Railroad Company, both for pipe and rail, is the same as it was when I came to New York nearly ten years ago.

Q. A copy of the contract was furnished by Mr. Archbold, and fixed the dates pretty definitely. But you say the rates have not changed for ten years? A. For ten years.

"PLEASE TURN ANOTHER SCREW."

Regarding the letter from Chess, Carley & Co. to J. M. Culp, general freight agent of the Louisville and Nashville railroad, June 16, 1881, in which the expression was used: "Please turn another screw." The firm of Chess, Carley & Co. was a partnership in which the Standard Oil Company of Cleveland had an interest. This was before the formation of the Standard Oil Trust, which was formed in 1882, and the firm of Chess, Carley & Co., as I have testified, was a partnership in which Mr. F. D. Carley was the resident partner and manager. The Standard Oil Company of Ohio had an interest in the Chess-Carley business, but absolutely no control or direction of that company's affairs. I was in the office, and the only boss we knew was Mr. F. D. Carley. I should like to refer, in regard to Mr. Carley's control of that business, to his testimony taken before the Bacon committee in 1888. On page 526 of that committee's report Mr. Carley testified as follows (reading):

"Q. Were you a member of the firm of Chess, Carley & Co.? A. Yes, sir.

"Q. At what time? A. Through its whole history.

"Q. Over what years does that extend? A. I do not remember exactly, but think somewhere about 1869 or 1870 we formed that firm.

"Q. When did you terminate it? A. When we formed the Chess-Carley Company.

"Q. When was that? A. Four or five years ago. I was president of it until its dissolution.

"Q. State whether or not it was dissolved when it sold its property to the Standard Oil Company? A. Yes, sir.

"Q. Are you connected with the Standard Oil Company? A. No, sir.

"Q. You occupy no position under it? A. No, sir.

"Q. Where did you reside during the time you were a member of the firm of Chess, Carley & Co. and the Chess-Carley Company? A. Louisville, Ky.

"Q. Had you charge of that business? A. Yes, sir;

I was sole and exclusive manager of the Chess, Carley & Co. and of the Chess-Carley Company."

The party who wrote this letter (and without the knowledge of Mr. Carley) was a Mr. Hathaway, who had formerly been in the Louisville and Nashville railroad employ. His explanation of this letter was that when errors occurred in the Louisville and Nashville railroad office there was an expression used, that the machinery of the office was loose," and it should be corrected or tightened up by turning a screw. In the case referred to, the shipment of a car of oil by Rice to Nashville was billed at less than the regular tariff rate which other shippers were paying, and Hathaway simply called their attention to the error and used the expression referred to. By reference to page 530 in the book of testimony taken before the committee on manufactures in 1888, it will be seen that Mr. F. D. Carley testified as follows (reading):

"This much I know about this letter that Hathaway wrote. He would say to me, 'Mr. Carley, there is another car load gone through to Wilkerson,' or to whoever it might be. I said, 'I do not think it is right on the part of the road. Can not you get them to stop it? I mentioned it to them before. They said it was the fault of the clerk; that it was clerical.'"

Now, on page 524 of the same book, Mr. J. M. Culp, who is the gentleman to whom the letter was addressed, and who was general freight agent of the Louisville and Nashville road, and who is now traffic manager of the Southern railway here, testified as follows (reading):

"I desire to say, with regard to that letter, or rather with regard to the rate charged on the shipment referred to in that letter, that it was less than the proper rate. It was less than any rate that we had with Chess, Carley & Co., or I believe ever have had. It was a fifth class rate. Our rate on oil from Louisville to Nashville was higher than fifth class, and I presume the desire of Chess, Carley & Co. was to have at least as high a rate as was charged on their shipments charged on this. Had that letter come to me—had I seen the letter—I would have simply understood it that it meant that we should require our agents to charge at least as high a rate as was charged on the shipments of Chess, Carley & Co.

This is the explanation of it, and in my opinion a very reasonable one. The facts are, as Mr. Culp has testified, and as I recollect the occurrence, that the rate charged on that shipment was less than we were paying at that time and less than we ever paid, even prior to the interstate commerce law.

CHESS, CARLEY & CO.'S GROCERY STORE.

Mr. Rice alleges that the Standard Oil Company established grocery stores in the south. This was before the Standard Oil Company had any control or direction in Chess, Carley & Co.s business, as that business was entirely under the control of Mr. F. D. Carley. And the establishment of that grocery store, as referred to by Mr. Rice, was during the time of Chess, Carley & Co.

Q. (By Mr. Jenks.) Such a grocery was established by Chess, Carley & Co. for the purpose alleged by Mr. Rice? A. There was such a store.

Q. (By Mr. Smyth.) Was there only one? A. Only one.

Q. (By Mr. Jenks.) Was it established for the purpose of driving out a competitor in the oil business? A. I did not say that. I say that Chess, Carley & Co. established that store to sell groceries and oil, the same as there were stores established selling oil and groceries.

Q. Did Chess, Carley & Co. have stores elsewhere for the purpose of selling groceries and oil? A. No; it only had that grocery store. Probably the profits of that were not sufficient to justify any extension.

Q. (By Mr. Smith.) Where was that store? A. Columbus, Miss.; but the Standard Oil Company had no more to do with it than that stenographer.

Q. (By Senator Kyle.) Have the Standard Oil Company ever indulged in such a practice? A. It has not to my knowledge, in any way or at any place.

Q. Prior to the interstate commerce act or since? A. Not to my knowledge.

Q. Have they ever made any threats in that direction through their agents? A. Not to my knowledge.

Q. You do not know, then? A. I do not.

TANK CARS.

Regarding McDougal declining to build tank cars for Rice on credit, the Standard Oil Company never directly or indirectly had anything to do with it and never had any knowledge of it until it was seen in Mr. Rice's testimony.

The charge that the Standard Oil Company bought up tank cars from railroads, in order to keep them from other shippers is positively denied.

As to railroads owning tank cars, I would say that the tank car is a special car, used for the transportation principally of petroleum, and it would be a burden upon the railroads if they were required to invest their capital in tank cars. The ownership of the car would not insure transportation of oil, and if every railroad were required to have a sufficient tank car esquipment to do the oil business that at times moves over its rails it would mean the building of many more tank cars than the business would require. For instance, say it would require 200 tank cars, costing $150,000, to transport oil between Chicago and St. Paul and Minneapolis. There are five lines competing for this business, and if each railroad was required to own 200 cars there would be four times as many tank cars as the business would require. Take as another example the McDonald field, which was a producing field and is now. At one time it produced oil to the extent of 60,000 to 80,000 barrels a day. It has run down now to 5,000 barrels. If the Pennsylvania road and the Lake Erie and Western, which are the two roads which touch that field, had been required to furnish tank cars to move the oil produced in the McDonald field when it was producing 60,000 to 80,000 barrels a day those roads would be in rather bad shape with their tank cars now, when there is only 5,000 barrels to move from there. A tank car is just

like a Pullman car; you might just as well require a railroad to own all the Pullman cars that are necessary to go over its road as to require the railroad company to own all the tank cars that may at times go over its rails.

Q. (By Mr. Kennedy.) Can you state which is the cheaper system for the railroads to employ in the transporting of oil—the tank car or barrels? A. I would like to say now the tank car by all means. But Mr. Rice referred especially to that in his evidence, and I will touch that later on. If you will allow me to proceed in the regular order of his testimony, I think it is better to go right through it.

TANK CARS FAVORED AS AGAINST BARRELS.

Mr. Rice alleged great discriminations in favor of the Standard Oil Company as against himself for a year or so after the passage of the law. I would say that he refers to the published tariffs of the various railroads, that were published and printed and open for all on the Louisville and Nashville railroad and other railroads which at that time made lower rates on oil in tank cars than on oil in car loads in barrels. These were published tariffs and open to everybody, and Mr. Rice and other shippers shipped in tank cars as well as the Standard Oil Company, and the Standard Oil Company shipped oil in barrels and car loads the same as Mr. Rice and other shippers. It was simply a tariff rate in which the railroads made a difference between the tank car rate and the barrel box car rate, and it was open to all; there was no discrimination between parties at all. It was a discrimination, or difference rather, between two modes of shipment.

Q. (By Mr. Jenks.) At that time had there been any ruling upon the relative rates for tank cars and barrel shipments by the interstate commerce commission? A. There had not been; but in 1888 Judge Cooley, of the interstate commerce commission, ordered that the rates per hundred pounds on oil in tank cars as well as on oil in barrels in car loads, including the weight of the barrels, should be made the same, and the railroads adjusted their tariffs according to that, and the tariffs remain on that basis today.

Q. At the time Mr. Rice claims he was discriminated against in this way was he, as a matter of fact, shipping oil in tank cars? A. He had a few tank cars, and other shippers had tank cars; and as far as the higher rates on oil in barrels are concerned, the Standard Oil Company was shipping more in barrels than all the others put together.

Q. How about the relative amounts in barrels and in tank cars shipped at that time over these roads? A. At that time I would say that, as I recall the evidence which was given at that time in this book, our car load shipments were in excess of our tank car shipments.

Q. Your barrel shipments? A. Our barrel shipments were in excess of our tank car shipments.

Q. Over those roads on which you said the discriminations were made? A. Over those roads the shipments—prior to those shipments the rates were made on barreled oil and tank cars; the tariffs were published, and they simply pursued that same system of making rates, and it was open to everybody that had both methods of shipment.

Q. And other shippers than the Standard Oil Company had both modes of shipment which they were using? A. Absolutely.

"OUTAGE" OF 62 GALLONS ON TANK CAR SHIPMENTS.

Mr. Rice refers to outage of 62 gallons and then 42 gallons which was made on all tank car shipments. This was an allowance for the average loss between the full shell capacity of the tank car, which tank car was loaded at the loading point, and the amount that was taken by actual measurement to be received in the tank car at destination. This allowance was made to all tank car shippers alike and was reasonable, as the actual loss was in excess of the allowance. The allowance, however, was discontinued in the summer of 1892, and has never been reinstated. The principle of that allowance was simply that the railroad ought not to charge on a quantity greater than it delivered, and as the actual result and experience had shown that there was a loss between the amount of oil put into the tank car at the refinery and the amount delivered at the point of destination, an allowance was made, which was very small, at that time 62 gallons, and at another time 42 gallons; but this, as I say, since 1892 has been done away with completely.

ESTIMATED AVERAGE WEIGHT OF PETROLEUM PRODUCTS.

Mr. Rice refers to the relative charge made by railroads between oil in tank cars and oil in barrels in car loads. The railroads receive a very much larger percentage of live weight on oil in tank cars than on oil in barrels. Railroads charge and collect freight on tank car shipments at full shell capacity of the tank car, no matter whether that tank car is loaded to its full capacity or not. The average capacity of the Union Tank Line Company's cars today is 140 barrels, and it is on that basis that the railroads charge and collect their freight.

Q. (By Mr. Smyth.) You do not weigh the cars? A. The weight of the petroleum in tank cars is taken on the basis of the full shell capacity of the tank, based on an average weight of 6.4 pounds to the gallon. The reason for that is that some products of petroleum, such as naphtha, weigh from 5¼ to 5¾ pounds to the gallon; refined oil weighs 6½; lubricating oil weighs from 7¼ to 7½ pounds to the gallon and the average weight of 6.4 pounds represents the actual average weight of the various products of petroleum as they are manufactured and as they are shipped through the United States; and the reason the railroads have made such a rule is to prevent misrepresentation and the cost that would be involved in weighing every tank car. You can see that it would be a very difficult matter for a railroad to get the actual weight of tank car shipments, because those tank cars are first loaded at the refinery and not in the railroad yard, as ordinary freight is, and then pulled out by the railroad. They could only weigh, therefore, the full tank car with the weight of the car added to it, and that car is probably destined to some

point away beyond that railroad that receives it on its rails. So the custom has been ever since I have had any knowledge of the business to have one average weight which applies to all products alike and applies to all shipments alike.

Q. The average is both as to weight and capacity? A. No; the average is as to weight. The capacity of the tank car varies, and the capacity is shown by the various tank car owners to the railroads, and they publish it at large to the world in the form of this tank gauge handbook, which shows the actual number, owner and capacity of every tank car that is used over the various lines in the United States today.

Q. (By Senator Kyle.) And the average charge is, as you state, 6.4 pounds to the gallon? A. To the gallon.

Q. For the full tank capacity? A. Full shell capacity of the car.

Q. (By Mr. Smyth.) Do all the large refining concerns own tank cars? A. Very largely. I will show you the tank car ownership in the United States in a few moments. The same rule applies, I might say, where oil is shipped in barrels. There is an average of 400 pounds applied to the various products of petroleum. Some weigh less and some more, but 400 pounds is the accepted weight on railroads on all petroleum products.

TANK CARS RETURNED FREE.

Q. (By Mr. Clarke.) Those which you have referred to are for freight one way, I suppose? A. The freight rate is charged, of course, only on the freight that is hauled.

Q. (By Mr. Smyth.) Does the car come back empty? The car comes back empty; the tank car as well as the box car, very largely, simply because the box car when loaded with oil is unfit for use for sundry merchandise. You will find that every large oil carrying railroad in the United States has the box cars marked "oil," meaning that they can be used only for oil. I do not mean to say they are never used for any other freight, but they are set aside for that purpose.

Q. (By Senator Kyle.) Is there any charge for these return tanks? A. No charge.

Q. Has there ever been a charge for return tanks? A. No, sir; not in my recollection.

Q. Have they ever charged the independent companies outside of the Standard Oil Company for the return of these tanks? A. No, sir. They charge the Standard Oil Company the same rate. I mean to say that since the passage of the interstate commerce law there has been no charge on the return of what is known as regular tank cars, the cylinder tank car, within the United States, excepting to one section.

Q. (By Mr. Smyth.) There is no freight charged on empty cars, is there? A. No, sir.

ADVANTAGE OF TANK CARS.

I digress from this question as to the relative charge. I have stated that the average capacity of the Union Tank line car today is 140 barrels. The minimum weight required by railroads in the shipment of oil in barrels is 60 barrels, and not one per cent of the car loads of oil in barrels in the United States run over 60 barrels, from the fact that even loading 60 barrels in an ordinary box car requires putting them up on top of the lower tier. This is an expense to the owner and the railroad, and it also causes leakage from the rolling of the barrels on top. The result is that car loads of oil shipped in barrels in box cars average 60 barrels as against the average capacity of tank cars of 140 barrels. Therefore one tank car holds twice as much as a box car when loaded with oil and the railroads receive their pay accordingly.

Q. It takes less cars? A. Necessarily. It means one car instead of two for the same freight. It means carrying two cars for one; all expense of handling, and the cost of two cars.

Q. (By Senator Kyle.) And the expense of unloading is less? A. Yes; in the tank car. It is universally loaded by the shipper and unloaded by the consignee. In the box car it is generally loaded by the shipper and very often unloaded by the railroad in their depot. The tank car never is.

Q. (By Mr. Jenks.) Is the freight rate the same per barrel, whether in barrels or in tank cars? A. It is the same rate per 100 pounds. In barrels the weight of the barrels is charged for.

Q. So when shipped in barrels freight is charged on 400 pounds? A. Yes.

Q. When in tank cars it is 300 pounds for the same amount of oil. A. Yes.

Q. That makes shipping by tank car cheaper than by barrel? A. Absolutely; but the barrel is an article of merchandise. When the oil is sold in barrels the value of the barrel is added to it. There is no ground why the railroad should, on an article of merchandise, which the barrel is, receive no pay for the shipment. Admitting the pay on the weight of the barrel, the railroad then only gets half as much revenue on the oil in barrels as on tank cars of oil.

TARIFFS NOT MADE UP AT NO. 26 BROADWAY.

Mr. Rice charges that railroad tariffs were issued from No. 26 Broadway. I deny positively that we have ever made or promulgated any railroad tariff by any Standard Oil Company interest, and I am positive that no railroad tariff was ever promulgated by any Standard Oil Company interest.

Mr. Phillips. I will ask Colonel Clarke to take the chair, as I expect to ask some questions in a short time. I shall be obliged to you, colonel, if you will take the chair.

Q. (By Mr. Jenks.) You say that no oil tariff has been made or promulgated by any of the Standard Oil Companies. I suppose that when that statement was made it was not intended to be taken literally. Would you go so far as to say that the Standard Oil Company, or the Standard Oil officials, did not reason with railroad officials in order to get them to agree upon what they considered to be a fair and just rate of freight on oil? A. I certainly do not wish to be understood that myself or possibly others of our representatives have not seen railroads in regard to tariffs

on the shipments. We do have intercourse with railroad officials, as every large shipper probably does, but that we have ever issued— Mr. Rice's intent certainly was to give the idea that we simply named a rate and sent it to the railroads to accept. It is not true.

RATES NOT ARRANGED TO FAVOR STANDARD OIL SHIPPING POINTS.

Q. Is it a fact, as has been frequently stated, that over lines of railroad where the Standard Oil Company has very large shipments the rates on oil are frequently made, relatively speaking, lower than over other roads where the business rivals of the Standard Oil Company have large shipments and where the Standard Oil Company's interests are relatively small, and that this difference in rates to the advantage of the Standard Oil Company is brought about by the influence of the Standard Oil Company officials? A. That is absolutely not true, sir. In the first place I do not know any railroad on which competitors of the Standard Oil Company ship that we do not ship on ourselves; and the oil rates of the United States from the various oil shipping points are on a basis. In other words, the same rates apply from all of the Pennsylvania oil fields, both east and west, and the same is true of the Lima field; and while we may not be located at the very point some competitor is, he has the same rate from his shipping point in that field that we have from our shipping point in the same field.

Q. Your main distributing points are, I suppose, ordinarily different from those of your chief competitors. Would you be able to secure rates from your main distributing points which would affect your business favorably and not affect your rivals in the same way? Is that frequently true? A. I do not think it is, sir. I can only say that we get exactly the same rate from the same point and to the same point that every other shipper pays from and to that point.

STANDARD MEN CONNECTED WITH RAILROADS DO NOT GET SPECIAL RATES FOR THE STANDARD.

Q. (By Mr. Kennedy.) Are the Standard Oil Company officials stockholders ever in a position, as railroad officials, where they can give favors to the Standard Oil Company in its shipments? A. I am glad you asked that question, sir. I do not think it, but I know. Mr. Rice wishes to give that impression, and I can say in reply that since I have had any knowledge of railroad rates on the Standard Oil Company's business, no official of the Standard Oil Company who is connected with railroads has ever made a rate or arrangement for the Standard Oil Company, nor have any of those gentlemen who are connected and have interests with railroads ever asked me to give any undue or unreasonable, or in fact, any share of the Standard Oil Company business over such a railroad. In other words, the Standard Oil Companys business stands on its own merits; and as I before said, none of these gentlemen who may or may not have interests in these various railroads have ever made a rate or made an arrangement for Standard Oil Company business. That business is done by me, or by the proper party in whose territory or district the question may arise.

Q. Should you be sure to know whether that was so or not? A. I should know. If any of the gentlemen who have large railroad interests, as alleged, made a tariff or arrangement with a railroad for our business, I certainly should know of it. I should be advised of it, as I am the proper department that has a record of those rates, and should have to know, necessarily.

Q. (By Mr. Smyth.) Do we understand that shipments of the Standard Oil Company have not been influenced toward certain lines by the fact that the officers of the Standard Oil Company were reputed to be large owners of the stock in those lines? A. In no way, sir; and you can readily see that if the Standard Oil Company's business was run on the basis of favoring the individual interests of the different stockholders of the Standard Oil Company, the company's business itself would necessarily suffer.

Q. (By Mr. A. L. Harris.) It is true that officers of the Standard Oil Company have offices in different railroads? A. It is true that Mr. William Rockefeller, for instance, is a director in some of the railroads. He probably is also a bondholder in the United States. but there is no connection between such interests and the interests of the Standard Oil Company, or the business of the Standard Oil Company.

ALLEGED TANK CAR DISCRIMINATIONS.

Q. (By Mr. Clarke.) We will proceed.

The witness. Mr. Rice refers to a rule of the Southwestern bureau in regard to charging on the weight of a tank, when that tank is intended for storage, at the same rate as on the oil contained in the tank. If, as Rice alleges, the Standard Oil Company owns nearly all the sub-stations of the country, this rule is hard on the Standard Oil Company. If the railroads wished to discriminate in favor of the Standard Oil Company, they would carry the weight of the tank free the same as they do the regular tank car. Do you understand? Here is a tank that is intended to be used as a storage tank at some sub-station. It is loaded with oil and sent to that station. The railroad rule referred to charges the same rate per hundred pounds on the weight of the tank as on the oil contained in the tank. Now, ordinarily on the tank car there would be no charge for the weight of the tank. If they wanted to favor us, all they would have to do would be to treat that tank containing the oil as they do the ordinary tank car.

Q. (By Mr. Phillips.) There is one question I want to ask. That is in regard to shipping oil by barrel and by tank car. Has it not been testified that it is much more dangerous to ship oil in tank cars than in barrels, in case of collision and fire? A. It may have been so testified, sir. Different men have their different opinions; but the answer to that is that the tank car is growing in favor, not only in the shipping

of petroleum, but in shipping all other liquid products, which are open to the same objection. I think the economy in shipping in tank cars over shipping in barrels, which is being shown by the enormous growth in the use of tank cars for a great many liquids, proves that the tank car is a better method for shipping. And the Central Freight Association rule to which he refers is entirely proper, as it is intended to prevent the unloading of bulk petroleum in railroad yards or depots without proper facilities, as such unloading would increase the danger of loss by fire. The rule simply means that they will not allow a tank car to be held in the depot or in the yard of a railroad to be unloaded by improper means into a tank wagon or into barrels, as leakage or accident might result, to the large loss of the surrounding property, and they simply require that proper facilities should be at the point where the tank car is shipped to.

The Southern Pacific tariff: The rule referred to was submitted to the interstate commerce commission, who did not order it stopped when they decided the transcontinental case of 1890.

Q. (By Mr. Jenks.) Will you be kind enough to state the rule? A that rule was simply the rule by which the transcontinental lines charged for returning the cylinder car, and did not charge for returning what is known as the box tank car. The box tank car is a car which has a tank in each end and loading space between. There are other shippers besides the Standard Oil Company that ship and own these cars, and the Standard Oil Company ship both these cars and cylinder cars to the transcontinental points, and they pay exactly the same rates on cylinder cars as other shippers and get their box cars returned free the same as other shippers.

TEMPORARY REDUCTION FOR THE PROFIT OF THE STANDARD.

Regarding alleged correspondence from the Standard Oil Company's San Francisco office, I know nothing about this correspondence and can not verify it. It would be fair to say, however, that I have full knowledge on all rates paid in California, and I can say positively we pay the tariff rates in force at the time of shipments, wherever made; Mr. Rice's charge there was that the rates were put up at one season and put down at another from Chicago and other eastern points to the transcontinental points. I can say, and the interstate commerce commission can affirm, that the rates on petroleum and its products from Chicago and other transcontinental points have not been changed since March 2, 1891. The rates have absolutely been the same for nearly nine years.

"COMMISSIONS ON FREIGHT."

Regarding commissions on freight business and charges that the Standard Oil Company make their own commission, it is absolutely false, and I state unqualifiedly that the Standard Oil Company has never received, either directly or indirectly, a commission from any railroad in any form since the passage of the interstate commerce law.

Q. (By Mr. Phillips.) Should you be in a position to know absolutely if it received any? A. I should, sir.

Q. In regard to all railroads and transportation? A. I should, sir.

Q. And in regard to divisions and local freights in certain sections, and so on,, would it bar others than the Standard Oil Company from entering those sections? You would be in position to know all about that, should you, either directly or indirectly? A. I did not catch the last part of your question. I should know if the Standard Oil Company received any benefits throughout the United States, and I would unqualifiedly say they have not.

AS TO LOCAL RATES FAVORABLE TO THE STANDARD.

Q. I think it has been testified before this commission that in certain sections of the country, while they may have a through rate of freight up to a certain division of the United States, local rates are made so that independent refiners can not enter those portions, and in a way, indirectly, the Standard Oil Company has an advantage, which would be similar, and perhaps superior to a rebate or drawback? A. If you mean, sir, because we have refineries at the Atlantic seaboard to supply New England and at Chicago to supply the west, as compared with the man who has his refinery in the oil regions and tries to supply both the west and New England, I admit we have advantages; but I say we pay the same rate of freight from the same shipping point to the same destination as every other shipper does.

Q. And there are no local rates, as far as your knowledge goes, that would interfere with the independents entering that subdivision? A. Whatever the local rate is from any point to any point we pay the same as any other shipper pays from that point to that point.

Mr. Clarke. You may proceed.

RECEIVERS COWEN AND MURRAY'S LETTER.

The witness. In regard to the letter from Receivers Cowen and Murray to the interstate commerce commission, in which they admit paying rebates since the passage of the interstate commerce law, and which Mr. Rice assumed means paying us large rebates, I would say positively that since the passage of the interstate commerce law the Baltimore and Ohio railroad has not paid us one dollar in rebates, or in any way made any concession from their tariff rates. Mr. Archbold filed with this commission a letter from the Baltimore and Ohio railroad dated August 21, 1899, confirming this statement.

Q. (By Mr. Kennedy.) Would you say that an inspection of the books of the Baltimore and Ohio Railroad Company would not show that rebates or discriminations or commissions or anything of the kind had been paid to the Standard Oil Company since the passage of the interstate commerce law? A. I would; absolutely, sir.

Q. (By Mr. Smyth.)You know Mr. Rice stated that rebates were not paid, but that commissions were

given to persons to secure the business of the Standard Oil Company and others? You deny that? A. Previously I denied that we received commissions in any form from any railroads. That applies particularly to the Baltimore and Ohio and any other railroad you wish to point out.

UNDERBILLING OF TANK CARS.

Regarding alleged underweighing of tank car shipments from Boston to Newport, R. I.: For most of the years 1896 and 1897 we were making occasional shipments of naphtha in tank cars from Boston to the Newport Gas Company. The shipments altogether amounted to some 15 or 20 tank cars during the entire period. On three or four of the cars the New York, New Haven and Hartford railroad, through clerical error, billed these cars at less than their actual weight. This resulted in an under charge. As soon as it was discovered the balance due was paid.

The railroads transporting these shipments, as well as all railroads of the United States, had the actual capacity of all these cars, and the error occurred through no fault of the Standard Oil Company.

I shall hand as an exhibit Tank Gauge Book No. 4, which is the fourth book which has been published by the Central Freight Association, giving the capacity of all tank cars of the Union Tank Line Company. The same publication has been in the hands of the railroads for the past ten or fifteen years. This book contains the number and the capacity of the tank cars referred to by Mr. Rice. We furnished this information to the railroads, and we submit that it is not likely that, having furnished the actual capacity of the cars to the railroads, we would go to these same railroads on interstate shipments and show a less rate, because it would simply mean that we would know that we were violating the law and furnishing evidence to prove that we had.

The interstate commerce commission through Commissioner Prouty, investigated this charge at Boston, March 12, 1898, and after the investigation dropped it, as it was clearly shown by testimony taken there that the mistakes were simply clerical errors. I wish to offer a sworn statement of Vice President Hall (now president)of the New York, New Haven and Hartford railroad, which was given in answer to the request of the interstate commerce commission in regard to this very matter, in which he gives the detail of the shipments for the two years. I read from his answer that the mistakes occurred "through error of this (railroad) company's agent and without misrepresentation or fault on the part of the shipper."

I refer now particularly to the two cars which Mr. Rice refers to; two cars containing 100,986 pounds which were carried at 48,000 pounds.

Q. (By Mr. Jenks.) Was this the same case investigated by Mr. Prouty? A. Yes. Vice President Hall, who is now president of the New Haven road, says this in his sworn answer: "(h) On the 19th day of May, 1897, this company received from the Boston and Albany Railroad Company at Boston two U. T. L. cars, Nos. 7915 and 1286, consigned to the Newport Gaslight Company, containing naphtha, weight 48,000 pounds, which this company rebilled from Boston to Newport at its rate of 10 cents per 100 pounds; total charges $48. Said weight was that given in the waybill of the Boston and Albany Railroad Company as delivered to this company and accepted through error of this company's agent and without misrepresentation or fault on the part of the shipper. It was subsequently found that the weight should have been 100,986 pounds, and correction thereof was made. Its charge of 10 cents per 100 pounds on the difference, amounting to $52.98, was collected.

I also offer in connection with that case the testimony taken before Commissioner Prouty at the hearing in Boston March 12, 1898, and I would like to read from Mr. Winlock's testimony at that time. Mr. Winlock was general agent of the New Haven road at Boston, and testified that he had full charge of rates from Boston to all points on the New Haven road.

Mr. Winlock says: "I have nothing to say except what Mr. Page has said, so far as the relations between the New Haven road and the Standard Oil Company are concerned, is absolutely true. There is no arrangement of any kind between the Standard Oil Company and the New Haven road by which they can get any better rates, whether it is by a rebate, or by underbilling, or by anything of that kind, than what everybody else gets. Our rates are published, and posted for everybody. These under charges in weight were errors of our local agents in accepting them as such. They should have investigated the matter more than they did. Instead of blindly taking the weights given by the Boston and Albany railroad vouchers, they should have taken some means, as they did in nearly every other case; to get at the proper weights. The tariffs to Newport were based on actual weight, and instead of taking this constructive tonnage of the Boston and Albany road, which they used for purposes of their own, they should have taken, as I have said, some means of ascertaining the weights in every case. The other cases were errors of theirs."

Q. (By Mr. Jenks.) I see in the testimony that the weights are taken from the Boston and Albany. I understand your shipping point is East Boston? A. It is.

Q. And the Boston and Albany road takes the oil from East Boston to where it delivers to the New Haven and Hartford? A. Yes.

Q. Is it true, as has been stated, that when oil is delivered to the Boston and Albany road by your people the billing is done by your people, directly, and that you furnish the weights to the Boston and Albany? A. It is not true, sir, as was shown in this testimony. I will explain it: Our works are located at East Boston on the Boston and Albany road. The Boston and Albany road have to switch any car from Boston to East Boston, where the cars are delivered to the New Haven road. That switching charge, as I recall it, is $6 per car; either $4 or $6 per car. The Boston and Albany road, like many other roads, wishes to show the tonnage, whether the rates are per car or per hundred pounds; and where the rate is per car, as in this instance, it probably uses 24,000 pounds, which is the usual car load weight. They simply put in 24,000 pounds. The testimony shows, and I swear

now, that we did not give the Boston and Albany road 24,000 pounds as the weight of those cars, nor did we give them any weight. We did notify, not only directly, but through this book, the actual weight of all those cars, and it was simply an error of the New Haven road, as shown in the testimony, and as offered by Vice President Hall, that the New Haven road took in error the constructive weight of the Boston and Albany in their bill, instead of taking the actual weight, which they had in their power to get, and should have got.

Q. It is usually the custom of the Boston and Albany in their shipping to put in the minimum weight, 24,000 pounds? A. It seems to be so in this case. I can not say what the general custom is, but it is the custom. There is nothing exceptional in the Boston and Albany having a switching rate for switching; it is no more than any other railroad does.

Q. As to the regular custom of the Boston and Albany in shipping to points in Massachusetts, you would swear somewhat positively that their shipping rates are based on the full car rates? I am not speaking of interstate traffic. A. I say this: that, as far as the Boston and Albany rates are concerned, whether within the state of Massachusetts or without the state, we pay exactly the same rates as any one else pays from Boston to the same destination. Now, I can not recall and I do not know every local rate on every railroad in the United States, but I do know that we pay the same rate of freight from the same point to the same point as every other shipper.

Q. Whether it be local, within the state, or interstate? A. Yes.

Q. (By Mr. A. L. Harris.) Who determines the weight and contents of the tank car as listed in your book? A. The capacity of the tank car is first found in the case of the Union Tank Line Company by measurement, and that is confirmed by water gauge, and the Central Freight Association have a bureau of inspectors who go around and test the capacity of those cars.

Q. Each car is numbered? Each car is numbered and each cars capacity in gallons is given, and its equivalent in capacity in pounds, based on the average weight of 6.4 pounds per gallon.

Q. (By Mr. Clarke.) What paper or vouchers passes from the Boston and Albany Railroad Company to the New York, New Haven and Hartford Railroad Company in that case? A. Simply a bill of Lading that that car which they receive at East Boston and which they delivered to the New Haven road at Boston was destined for the Newport Gas Light Company, at Newport.

Q. Do the Boston and Albany haul this freight over its line from Albany to Boston at a lower measurement or at a higher measurement? A. This shipment originated at East Boston on the line of the Boston and Albany road.

Q. Over the road that used to be called the Freight railroad from East Boston to Boston? A. I do not know the name of the road, but the switching charges is from Boston to East Boston.

Mr. Clarke. I will explain to the commission that it is a road some four or five miles long. It is rather more than an ordinary switch. This used to pass around through Cambridge and connect with the main line of the Albany road, and then ran back into Boston to connect with the New York, New Haven and Hartford.

REGION SUPPLIED WITH OIL FROM BOSTON.

Q. (By Mr. Jenks.) You spoke of this shipment originating at East Boston. Do you have East Boston for the main distributing point for all New England? A. For a section of New England.

Q. What section? How much is covered from your central distributing point? A. Well, I can not say. Of course, it is for Boston particularly, and I know we make shipments from there up to Portland, and I know we make shipments from there down into Massachusetts and Connecticut.

Q. Down as far as New Haven? A. Almost. I mean as far as New Haven. It depends upon what we may have in the Boston tanks, and what the order may be for. You know there are many grades of petroleum, and we do not carry everything required at that point or at every shipping point.

Q. Do you suppose that your ordinary shipments of petroleum for lighting purposes, at New Haven, for example, would come from East Boston? A. No; I do not think that we ship to New Haven from East Boston.

Q. You would to Providence and Newport, probably? A. Newport. In these cases it depends upon the stock and depends upon the situation. I can not answer as to the exact territory that may be supplied from and station, but would supply the territory as far as its location and stock was able to do so.

Q. How do you supply your shipping station at East Boston? A. We supply partly by rail shipments and partly by steamer shipments from New York and Philadelphia.

Q. From your refineries at Bayonne? A. From seaboard refineries, whatever one it may be.

WHY ARE THROUGH RATES REFUSED ON PETROLEUM PRODUCTS?

Q. The statement has been made here by some of the independent refiners that in their attempts to ship oil into New England from the west they had found that, although there were through rates on the regular tariff sheets for almost all kinds of goods, there were no through rates for petroleum on the New York, New Haven and Hartford. They stated that in shipping corn, or almost anything else, to Newport or Providence, they would get through rates the same as the Boston rates; but that on petroleum no such through rates were given at all; they had to give the local rate, and this local rate, added to the regular rate from the west, made a rate to New Haven or Newport or Providence very much higher than to Boston.

Now, the statement was made here that that applies not only to New Haven, but generally, and that the shippers of petroleum in the west were placed at a decided disadvantage on that account. Can you give

any reasonable explanation why the railroads should make a special exception of petroleum as to the furnishing of through rates? A. Why, I can say this—that I do not know anything about the corn rates at all.

Q. As to what is the general rate? A. I mean to say that there are many commodities which the railroads make rates on, on the basis of through rates and local rates, whereas they may be applying through rates on other commodities. I do not know anything exceptional in the matter of oil in New England as compared with corn in the west. I do know that we ship from the oil regions to New England to some extent, and we pay exactly the same rates as the other fellow pays.

Q. Can you mention some of the New England points you supply from the west or from regions of the west? A. I can not. I can say we do make shipments to New England as well as Boston. I know also we have made shipments from Cleveland, and also as far as Lima, and wherever we have made those we pay the same rates as other people do.

Q. Is it your rule to make shipments from Cleveland, Lima, or other western points to the territory of the New Haven road? A. Yes; we have.

Q. The general fact that you have a distributing point at Boston, from which you can supply this territory that is supplied by the New York and New Haven road, and that they can not furnish tariffs from the west, would seem to some of your competitors, at any rate, to give you some decided advantage, although no illegal advantage, over them. A. We do not deny that by having our refineries at the Atlantic seaboard and supplying New England from those refineries we have an advantage over the man who has to take the oil from Cleveland or the oil region, but we claim no fair adjustment of rates can be made that will put that man on an equality with us in that situation.

Q. Would you say further that the Standard Oil Company officials have not represented the matter to the New Haven road in such a way that they have succeeded in getting the New Haven road to refuse to make through rates on petroleum, while it does make through rates, and those equivalent to Boston rates, on a very large proportion of other goods that are shipped? A. I think that Mr. Commissioner Prouty answered that question by saying that the New Haven road in charging arbitrary rates on oil from Boston as well as from the Hudson river were receiving more money themselves than they would if they applied the through rate, and for selfish reasons they got the most money they could out of the traffic.

Q. (By Mr. Smyth.) Is it not a fact that those rates apply to a great many other commodities besides oil; that a larger rate is charged for the shorter distance? A. As I say, Mr. Smyth, I do not know much about other traffic. I can say specifically in regard to the difference in the rate of corn and oil that I do not know the reasons for it. I can say in a general way that I do not believe the railroads make rates that will injure the business or prosperity of the road. The prosperity of a road depends upon the prosperity of the patrons, and if the railroad makes any rates that are going to prevent shipping over their road, it seems to me they are doing what a reasonable man would not do; and my experience is that the railroads are represented by as high an order of intelligence in this country as any class that I know of.

Q. You have no reason to believe that oil is the only commodity that is charged a higher rate for the shorter distance? A. Absolutely none.

Q. I mean to that point? A. No, sir. I only know, however, about oil.

MR. WILLIAM ROCKEFELLER DOES NOT INFLUENCE TARIFFS ON THE NEW YORK, NEW HAVEN AND HARTFORD.

Q. (By Mr. Jenks.) It has been intimated by Mr. Rice and others that this special refusal to give through rates on petroleum by the New York, New Haven and Hartford road was presumably brought about by the fact that Mr. William Rockefeller was a director of the road, or by some other special influence brought to bear in favor of the Standard Oil Company to check these shippers of the west? A. I will say, as far as the New Haven road is concerned, and Mr. William Rockefeller, that absolutely I do not know of any arrangement, or any tariff, or any change in tariff, that Mr. William Rockefeller has ever suggested or influenced on the part of the New Haven road or any other road. I do not believe that Mr. Rockefeller knows who the traffic manager for his road is today, or would know him if he was in this room.

LOW RATES FROM THE STANDARD'S WORKS AT WHITING.

Q. (By Mr. Kennedy.) I see that your testimony has been so far in rebuttal of Mr. Rice; there was another witness before the commission who made a statement that I should like to hear you say something about. He is the gentleman to whom you just alluded, an interstate commerce commissioner. He made a statement before the commission which seemed to show that the Standard Oil Company had an advantage in shipping from its Whiting works down the Mississippi Valley to New Orleans over the independent shippers or refiners of Cleveland, Ohio. I do not know just what the figures were, but they struck me at the time, if true, as indicating that the Standard Oil Company did have an advantage in the rates that were made, a great advantage, over the refiners of Cleveland. As traffic manager of this tank line association, do you know anything about those rates? A. I know what the rates are from Cleveland and from Lima to New Orleans. They are based on the local rate to the Ohio river plus the rate from the Ohio river to New Orleans. The rate thus figures out, as I recall, less than half a cent a ton per mile. The haul from Cleveland to New Orleans is over 1,000 miles and has a low rate. As to the rate from Whiting to New Orleans we have an advantage. Whiting is some 400 or 500 miles nearer New Orleans than Cleveland. The rate from Whiting——

Q. (Interrupting.) Not that much nearer. A. Well, I do not know that it is, but it is appreciably nearer. And the rate from Cleveland to Whiting plus the rate from Whiting to New Orleans is higher than the rate from Cleveland to the Ohio River plus the rate from

the Ohio River to New Orleans. In other words, I mean to say that we are paying a higher rate in proportion from Whiting to New Orleans when you consider the haul from Cleveland to Whiting.

Q. (By Mr. Jenks.) The rate from Whiting, as you say, is considerably lower than from Cleveland. Do you know whether the rate from Whiting on other similar products, like linseed oil, for example, is lower than the rate from Cleveland to New Orleans? A. I do not know what the rates are on linseed oil either from Whiting or Cleveland.

Q. Statements have been made to this effect—I do not mean to say that these figures are exact, but approximately exact—that on linseed oil the rate from Cleveland to New Orleans would be possibly 28 cents, and from Chicago it would be somewhat less, say, 26, but that on petroleum the difference would be as great as from 31 to 26 cents, showing that there would be a considerable advantage to petroleum as compared with a somewhat similar product, like linseed oil? A. I can not testify on that; but you can not pick out any two commodities and say that because there is a difference on one between two points the same difference should apply to the other. The reasons governing commodities are very often different in the matter of their manufacture, of the territory that they go over, and the cost in getting them up to that point, and various and sundry reasons, which are good reasons from the railroad standpoint; and as they have the authority we accept them as good reasons.

Q. (By Mr. Clarke.) Are linseed oil shipments made in tank cars? (No answer.)

Q. (By Mr. Farquhar.) Is there a large shipment of linseed oil from Whiting? A. Without being an expert on linseed oil, let me call your attention to the difference. Linseed oil is grown very largely in the west. At Chicago linseed oil is nearer the point of production than it is at Cleveland. Now, there may be very good reasons why the rate from Chicago to New Orleans on linseed oil might be higher than it is from Cleveland simply because the traffic may stand more.

Q. The natural distributing point for linseed oil is east of Cleveland rather than west of it? A. The natural distributing point is west of Cleveland rather than east, because the oil is grown in the west.

Q. Would not the same reasons hold good for Buffalo the same as Cleveland? A. Yes.

Q. Now, does this commission understand you to say that the position of the Standard Oil Company on the seaboard, having an inside line of distribution, is an advantage that you get over all competitors, and that that one is just the one that you have? A. I do not understand what you mean by the inside advantage.

Q. By the shorter line of distribution—geographical distribution. A. At the seaboard for the east and at Chicago for the west, as I have said, we have an advantage over the man who is shipping at some interior point.

Q. And the Standard would have the advantage over all competitors on an even tariff? A. No.

Q. On an even tariff for all from the same point? A. Yes. I say we are on an even tariff for all. We ship from Cleveland where our competitor is, and we ship from the oil region where our competitor is; yet we have competitors on the Atlantic seaboard that pay the same rate as we do. We endeavor to supply each point from our nearest refinery.

Q. (By Mr. Clarke.) Do you know why your company located their refinery at Whiting? A. Because it was nearer the great west, which is a large consumer of oil.

HAVE OBEYED THE INTERSTATE COMMERCE LAW.

Mr. Farquhar, I do not know whether you were here when I made the explanation in regard to the Newport case.

Q. (By Mr. Farquhar.) I do not care; I will take the record as it came on that. A. But I will call your attention to the fact that the Standard Oil Company has shipped thousands of car loads of freight to all points in the United States, over nearly every railroad line in the country, and the freight bills for its cars pass through the hands of numberless employes both of the railroads and the shippers who have such large and diversified interests throughout the United States, and it would have been impossible to keep such rebates secret had any such been granted, especially since Mr. Rice and others like him have been on the constant lookout for something tangible by which to prove their oft repeated allegations that the Standard Oil Company has been violating the interstate commerce law. That law has been in effect for more than 12 years, and at the end of this period the best case that the opponents of the Standard Oil Company can produce is that involving a clerical error in the billing of three or four cars shipped from Boston to Newport; and I would like to see somebody else equal that record.

EARNINGS OF UNION TANK LINE COMPANY ONLY 4½ PER CENT.

Mr. Rice makes the statement that the mileage paid the Union Tank Line Company of three-fourths of a cent a mile pays back the investment every three years. I would say that since the formation of the Union Tank Line Company, August 1, 1891, that company has never paid a dividend, and that the earnings of that company for the eight years, 1891 to 1898, inclusive, have shown an average yearly return on the capital invested of 4½ per cent per annum. This return has been figured without charging off for depreciation, although according to master car builders' rules (on which railroads base their settlements between each other) a depreciation of 6 per cent per year is deducted in case one railroad destroys another railroad's cars. The three-fourths of a cent mileage paid the Union Tank Line Company is exactly the same as is paid all other tank car owners, and there are in the United States between 170 and 180 individuals and companies, entirely outside of the Standard Oil Company, owning an aggreate of 7,420 tank cars, while the Union Tank Line Company's equipment November 1, 1899, was 5,851 cars.

I offer a statement giving the names and ownership made up from the very best records we have, of the

owners of cars outside of the Union Tank Line Company, showing an aggregate ownership of nearly 2,000 cars more than the Union Tank Line Company has.

[Following is a copy of the exhibit offered by the witness:]

Statement Showing Number of Tank Cars and Owners of Same, Other Than Union Tank Line Company, Based Upon Best Obtainable Published Information as of November 1, 1899.

Name.	Location.	Number.
American Cotton Oil Company	Chicago	356
Alcatraz Asphalt Company	San Francisco	1
American Oil Works	Titusville, Pa	6
Arper, George W	San Francisco	5
Alexander Co., M. H	Cincinnati	4
Archer & Douglas Tank Line	Chicago	51
American Tank Line	Cleveland	225
Anglo-American Provision Company	Chicago	18
Armour Tank Line	do	126
Allegheny Valley Railroad	Pittsburg	37
American Product Company	Philadelphia	2
Baltimore & Ohio Railroad	Baltimore, Md	44
Baltimore & Ohio Southwestern Railroad	Cincinnati	5
Barrett Manufacturing Company	Chicago	83
Beaver Refining Company	Washington, Pa	2
Bay Terminal Railroad	Toledo, Ohio	181
Barber Asphalt Paving Company	New York City	18
Brazilian Turpentine Company	Allegheny, Pa	1
Buckeye Transportation Company	Cincinnati	2
Brittan Provision Express	Chicago	10
Burlington and Missouri River Railroad	Lincoln, Nebr	1
Boston & Albany Railroad	Boston, Mass	9
Central Railroad of New Jersey	New York City	30
Century Oil Company	Lima, Ohio	14
Cincinnati Oil Works	Cincinnati	1
Cleveland Refining Company	Cleveland, Ohio	10
Climax Tank Line	Titusville, Pa	52
Columbia Oil Company	New York City	40
Columbia Tank Line	Indianapolis, Ind	117
Continental Oil Company	New York City	3
Continental Refining Company	Oil City	25
Cornplanter Tank Line	Warren, Pa	35
Craig Oil Company	Toledo, Ohio	77
Crew Levick Company	Philadelphia, Pa	2
Crystal Oil Refining Company	Oil City	9
Cudahy Packing Company	South Omaha, Nebr	50
Cygnet Tank Line	Cleveland	14
Canadian Pacific Railway	Montreal	34
Canada Southern Railway	Detroit, Mich	35
Consumers' Gas Company	Toronto, Ont	9
Central Lard Company	New York City	31
Charlotte Oil and Fertilizer Company	Charlotte, N. C	5
Cleveland Linseed Oil Company	Cleveland	11
Cotton Oil Refining Co	Baltimore, Md	5
Crescent Tank Line	New York City	137
Crystal Tank Line	Chicago	154
Charleston & Western Carolina Railroad	Wilmington, N. C	6
Cleveland & Marietta Railroad	Cambridge, Ohio	2
Duffy, James M	Eldred, Pa	1
Dold Packing Company	Kansas City, Mo	96
Denver & Rio Grande Railroad	Denver, Colo	16
Emery Manufacturing Company	Bradford, Pa	54
Emery Candle Company	Cincinnati	2
Empire Oil Works	Reno, Pa	39
Eagle Cotton Oil Company	Meridian, Miss	34
Ellis & Company	New York City	80
El Paso & Northeastern Railway	Alamorgo, New Mexico	[illegible]
Florence Pipe and Tank Line Company	Denver, Colo	30
Freedom Oil Works Company	Freedom, Pa	47
Fairbanks, N. K	Chicago	20
Freret, F. W	New Orleans, La	1
Germania Refining Company	Oil City, Pa	15
Glade Oil Works	Warren, Pa	10
Globe Tank Line	Marietta, Ohio	10
Great Western Tank Line	Cleveland, Ohio	53
Green Line	Oil City, Pa	750
Guarantee Oil and Gas Company	Terre Haute, Ind	[illegible]

Name.	Location.	Number.
Gulf, Colorado & Santa Fe Railroad	Galveston, Tex.	5
Grand Trunk Railway	Montreal	92
Garden City Dairy Company	Chicago	20
Gate City Oil Company	Atlanta, Ga.	9
Goyer, G. W.	Memphis, Tenn.	7
Globe Refining Company	Louisville, Ky.	111
Holmes, A. S.	Buffalo, N. Y.	11
Holmes & Adams	Titusville, Pa.	6
Houston & Texas Central Railway	Houston, Tex.	4
Heinz & Co.	Pittsburg, Pa.	21
Hammond Tank Line	Hammond, Ind.	20
Independent Refining Company	Oil City	31
Independent Tank Line	Boston	4
Indiana Pipe Line and Refining Company	Chicago	85
Ivorydale & Millcreek Valley Railway	Cincinnati	59
International & Great Northern Railroad	Palestine, Tex.	13
Jobbins, William F.	Aurora, Ill.	4
Kansas City Tank Line	Kansas City, Mo.	100
Kentucky Refining Company	Louisville, Ky.	157
Keystone Syrup Company	Peoria, Ill.	11
Leader Refining Company	Washington, Pa.	18
Lewis Tar Tank Line	Rock Island, Ill.	7
Leonard & Daniells	Piqua, Ohio	14
Louisville Tank Line	Louisville, Ky.	91
Leonard & Ellis	Warren, Pa.	6
Lewis Roofing Company	Rock Island, Ill.	25
Louisville Cotton Oil Company	Louisville, Ky.	40
Lakeside & Marblehead Railroad	Marblehead, Ohio	1
Los Angeles Terminal Railroad	Los Angeles, Cal.	1
Lexington & Eastern Railway	Lexington, Ky.	1
Manhattan Oil Company	Lima, Ohio	755
Miller's Oil Refining Company	Allegheny, Pa.	7
Milwaukee Gaslight Company	Milwaukee, Wis.	5
Muir Tank Line	Warren, Pa.	10
Municipal Gas Company	Albany, N. Y.	10
Merchants' and Planters Oil Company	Houston, Tex.	123
Michigan Ammonia Works	Detroit	4
Mutual Refining Company	Charleston, S. C.	16
Metzger Linseed Oil Company	Chicago	3
Morris Tank Line	do	37
Mexican Central Railway	City of Mexico	65
Monterey & Mexican Gulf Railway	Monterey, Mexico	3
National Linseed Oil Company	Chicago	111
Nichols Chemical Company	New York City	29
Northern Pacific Railway	St. Paul, Minn.	6
New York Central & Hudson River Railroad	New York City	30
Ong Hiller & Co.	Cincinnati	3
Omaha Packing Company Tank Line	South Omaha, Nebr.	25
Pacific Coast Oil Company	San Francisco	45
Pacific Steam Whaling Company	do	16
Paine & Company	Wilkesbarre, Pa.	4
Paragon Refining Company	Toledo	106
Peerless Tank Line	Cleveland	135
Pennsylvania & Delaware Oil Company	New York City	10
Pennsylvania Paraffine Works	Titusville, Pa.	5
Penn Petroleum Company	Coraopolis, Pa.	2
Pennsylvania Tar Manufacturing Company	Chicago, Ill.	6
Penn Refining Company	Oil City	39
Powell & Co., M. W.	Chicago	1
Producers' Oil Company	Warren, Pa.	50
Provision Dealers' Despatch	Chicago	81
Peerless Transit Company	Cleveland, Ohio	201
Pittsburg Refining Company	Pittsburg, Pa.	5
Pecos Railway System	Carlsbad, New Mexico	10
Portland & Rumford Falls Railway	Rumford Falls, Me.	1
Red "C" Oil Manufacturing Company	Baltimore, Md.	4
Richardson Lubricating Company	Quincy, Ill.	2
Repauno Chemical Company	Wilmington, Del.	4
Rio Grande, Sierre Madre & Pacific Railway	El Paso, Tex.	6
Shawnee Oil Company	Lima, Ohio	49
Smith, Levi	North Clarendon, Pa.	6
St. Louis Southwestern Railway	Tyler, Tex.	4
Speare's Sons, Alden	Boston, Mass.	2
Solvay Process Company	Geddes, N. Y.	34
Southern California Railway	Los Angeles, Cal.	38

Name.	Location.	Number.
Southern Cotton Oil Company	Philadelphia, Pa.	50
Swift Refrigerator Line	Chicago	200
Sayers Tank Line	St. Louis, Mo.	20
Spencer, Kellogg	Buffalo	2
Sherman Oil and Cotton Company	Sherman, Tex.	200
Santa Fe Pacific Railroad	Los Angeles, Cal.	75
Santa Fe, Prescott & Phoenix Railroad	Prescott, Arizona	2
Sonora Railway	San Francisco	7
Southern Pacific Company, Pacific System	do.	123
Schwartzchild & Sulsberger	Kansas City, Kas.	2
Sherbrooke Tank Line	Capelton, Quebec	18
Texas & Pacific Railway	Dallas, Tex.	1
Titusville Oil Works	Titusville, Pa.	25
Toledo Linseed Oil Company	Toledo, Ohio	10
Trinity Cotton Oil Company	Dallas, Tex.	20
Texas Midland Railroad	Terrell, Tex.	24
Toledo & Ohio Central Extension Railroad	Marietta, Ohio	2
United Oil Company	Florence, Colo.	2
Union Oil Company of California	Santa Paula, Cal.	37
United States Ammonia Company	New York City	2
Warren Refining Company	Warren, Pa.	33
Waverly Oil Works	Pittsburg, Pa.	27
Wallace & Gregory Bros.	Paducah, Ky.	2
Western Chemical Company	Denver, Colo.	9
Wogan Brothers' Tank Line	New Orleans, La.	30
Wilburine Oil Works	Warren, Pa.	18
Wisconsin Central Lines	Milwaukee, Wis.	5
Western New York & Pennsylvania Railway	Buffalo	13
Wright and Hills Linseed Oil Company	Chicago	12
Total		7,420

Q. (By Mr. Kennedy.) Do these tank line companies outside of the tank line you are speaking for, carry oil for the Standard Oil Company? A. The Standard Oil Company ship, as far as they can, in Union Tank Line cars. They do use outside cars when they can not get the Union Tank Line cars, and need them.

Q. Now, the testimony is that the Standard Oil Company do pretty nearly 90 per cent of the business in the United States, and it would look a little curious that they could do that business with 40 per cent of the tank line cars of the country, unless they were using the cars of some other company to some extent. A. The explanation of that is that the tank cars used by other individuals are not confined to the use of petroleum, but their tank cars receive exactly the same mileage basis as is paid to the Union Tank Line Company; and that company, I say, as vice president of it, has shown an average earning of 4½ per cent per annum, charging off nothing for depreciation. It ought to be borne in mind in connection with the Union Tank Line, that, owing to the fact that during the summer the consumption of petroleum is small, a large part of the equipment of the Union Tank Line Company is idle, and during that time is earning nothing whatever; and at other times the volume of the business requires the whole number of cars owned.

Q. (By Mr. Jenks.) What did you say is the number of cars owned by the Union Tank Line Company? A. Five thousand eight hundred and fifty-one, November 1.

SEVEN MILLION DOLLARS REBATES FROM ATCHISON, TOPEKA AND SANTA FE RAILROAD; NONE TO THE STANDARD.

Regarding the statement that in 1894 an expert accountant discovered that $7,000,000 in rebates had been paid by the Atchison, Topeka and Santa Fe railroad, I would say that the Standard Oil Company did not receive one dollar of this money.

WHY THE UNION TANK LINE COMPANY CONTINUES TO DO BUSINESS WITHOUT PROFIT—WHY A SEPARATE ORGANIZATION.

Q. (By Mr. Conger.) I should like to return for a moment to this matter of tank cars. The statement made would indicate that that was very far from being a profitable business. As I understand, it has been continued by this company for a period of years, and I would like to ask upon what theory you are able to induce the stockholders to continue their investments and make additional investments from time to time as would seem to be necessary. A. The answer is simple: The tank car is a necessary facility in the economical distribution of petroleum and its products. It is one of the means by which we are enabled to ship oil cheaply and supply it cheaply. For that reason the investment, as you see, in the Union Tank Line Company is a proper one, for the Union Tank Line Company is the necessary arm of the petroleum business.

Q. The owners of the Union Tank Line Company,

to a large extent, are the same as the owners of the Standard Oil Company? A. You see—

Q. (By Mr. Farquhar, interrupting.) Is it not of just the same character as horses and vans and other things that are used in distribution? You can not expect a profit out of it, but it is an incident and a condition that you can not escape from in distribution? A. It has been one of the most necessary parts of the business in distributing economically the products of petroleum.

Q. (By Mr. Conger.) If you regard it in the same light as you do horses and freight wagons, why is the business conducted by an independent company—by the company called the Union Tank Line Company—and not by the Standard Oil Company itself? A. The Union Tank Line Company is simply a corporation that owns tank cars.

Q. What is the purpose or advantage of the separate organization? A. I am not a lawyer.

Q. You do not need to be a lawyer to answer a question like that, if you choose to answer it; it is a business question, not a question of law. A. I do not refuse to answer it. The Union Tank Line Company has been formed to own and run these cars over the various railroads of the United States for the transportation of oil.

Q. You have testified that there is no profit in it at all? A. I do.

Q. What I am trying to get at is why it is continued as a separate organization instead of by the Standard Oil Company itself directly? A. Well, if it is profitable or unprofitable, it would make no difference whether it was conducted in the name of the Union Tank Line Company or in the name of the Standard Oil Company; but it was formed under the name of the Union Tank Line Company, and I say it is a necessary adjunct in the distribution of petroleum, and it is therefore continued, although it is not profitable.

Q. (By Mr. Smyth.) I suppose the stock of the tank line company can be bought independently of the stock of the Standard Oil Company? A. I do not know.

Q. I mean is it listed for sale? A. It is a separate company.

Q. If a man becomes a stockholder in the Union Tank Line Company, does he necessarily become a stockholder in the Standard Oil Company? A. No; I do not understand he does.

Q. (By Mr. Kennedy.) In what state is the Union Tank Line Company incorporated? A. In New Jersey.

Q. Does the interstate commerce commission exercise control over it like any other interstate transportation company? A. Why, I never heard that the interstate commerce commission had control of private car lines. No; this is a car line.

Q. (By Mr. Smyth.) It does not make rates? A. It has no rate or payment like a railroad.

Q. (By Mr. Kennedy.) It does not come under the control, then, in any way of the interstate commerce commission? A. No; no more than the dressed beef cars or Pullman cars or refrigerator cars or any other private cars.

Q. (By Mr. Farquhar.) In the building and running of your tank steamships, is that done by a separate department of the Standard Oil, or is it the Standard Oil itself? A. I do not know enough to answer you in regard to that.

Q. (By Mr. Jenks.) The Union Tank Line Company has nothing to do with foreign shipments? A. Nothing whatever.

Q. (By Mr. Conger.) Referring to the number of stockholders in this organization, do you know whether they are many or few, three, four or five, or several hundred? A. Of what organization?

Q. The Union Tank Line Company. A. I think there are a great many; I do not know. I have never kept the books; the secretary could say how many stockholders there are, but I do not know.

Q. Do you know, or would you care to testify as to the salaries that are paid the officers of the company? The point I am getting at is this, that it such an organization is continued and continues in business when that business is so unprofitable as you testify, it seems to me that there must be some other way than through the distribution of dividends to make it profitable to its officers and stockholders. A. I think I have made that clear, that the tank car is a necessary adjunct in the petroleum business.

Q. Well, that is— A. (Interrupting.) And is necessary in enabling the Standard Oil Company to distribute the products of petroleum economically throughout the United States; and by economically distributing, it has increased its business—the Standard Oil Company's. Now, that the tank car line itself only shows, as I have testified, a return on the investment of 4½ per cent is no reason why it should be discontinued if it is necessary.

By Mr. Boyle. May I consult with the witness?

By Mr. Clarke. What is the pleasure of the commission?

By Mr. Farquhar. There is no objection at all.

(Mr. Boyle consults with witness.)

Q. (By Mr. Conger.) How long has this Union Tank Line Company been in business or operation? A. Since 1891, when the company was formed.

Q. The point I was getting at is the advantage that the Standard Oil Company gets by having this Union Tank Line Company continue in business. Does the Union Tank Line Company do it simply through philanthropic or generous motives toward the Standard Oil Company? A. I have testified that my knowledge and belief is that the present owners of the Union Tank Line Company and the Standard Oil Company are the same. Now, those owners think that the tank car is necessary in the conduct of the general business and therefore continue in the use of those cars under the name of the Union Tank Line Company .

Q. Well, that puts a little different light on it; I understood you to say that they were not the same in all respects? A. You misunderstood me; I said they were different corporations.

Q. Now, then, do you know of any reasons why the officials or officers of the Standard Oil Company should prefer to operate this as an independent company instead of by the Standard direct? A. I do not.

Q. (By Mr. Jenks.) When you speak of the Standard Oil Company, are you thinking of one company or the several Standard Oil Companies? A. I am speak-

ing of the company as it is generally known, as one company.

Q. Is this company that you are speaking of in that way technically and legally one company, or is it several—twenty-five different companies? A. I do not know that I am competent to answer as to that. There has been recently formed, as you know, the Standard Oil Company of New Jersey, which, as I understand—I had rather cancel that answer. I do not know; that is all.

Q. You had intimated some little time ago that there were probably some legal reasons which you yourself did not know about, for having this Union Tank Line Company organized as a separate corporation. Perhaps in the same way there are some legal reasons why the Standard Oil Company, which we speak of sometimes as one, was organized as different companies. I had thought it possible that as long as the Union Tank Line Company was serving so many different companies it might be a convenient matter legally for it to have its separate organization, and I did not know but you had — A. (Interrupting.) I am very much obliged for the suggestion. I have no doubt that that is the reason: That the Union Tank Line Company, as a separate corporation running its cars all over the United States, is in a better position to do so than if those cars were owned by the Standard Oil Company that was doing the manufacturing or the marketing business.

Q. You also had suggested that it was largely a matter of bookkeeping between all these different companies? A. Well, I did not mean to convey any such idea. I did mean to say this, and that is all I can say about it, that the Union Tank Line Company is a separate corporation, and serves all these companies in furnishing tank cars for shipment.

Q. (By Mr. Kennedy.) Have the tank cars that the Union Line owns been provided with air brakes and couplers in compliance with the interstate commerce law? A. They have.

Q. Consequently they are an instrumentality of interstate commerce? A. The cars are used in interstate commerce, yes, and would be subject to the general order requiring cars used in interstate commerce to be equipped with air brakes and couplers.

Q. I asked you those questions because you said in reply to a question of mine a little while ago that you did not know that a company like that was subject to the interstate commerce commission. A. As I understand that, you refer to requiring cars used in interstate traffic to be equipped with safety appliances, and that is not a part of that law.

Q. It is put under the interstate commerce commission's supervision. A. It is? Then to that extent they are.

THE TANK LINE'S ONLY INCOME IS ITS MILEAGE—IT PAYS NO COMMISSIONS.

Q. (By Mr. Smyth.) But they are not under the jurisdiction of the interstate commerce commission in reference to fixing rates, because on those cars the railroads fix the rates. A. We simply carry the oil and receive the mileage, the same as the railroads pay all other tank car line owners.

Q. (By Mr. Farquhar.) Does not your company stand in the same relation as the other private cars in this country? A. Exactly.

Q. Paying exactly the same as the other cars do? A. Exactly.

Q. (By Mr. Conger.) I would like to inquire if the witness can tell whether the Union Tank Line Company pays commissions to the Standard Oil Company for freight carried? A. They do not. They get nothing from the Standard Oil Company; the only thing that the tank line company gets is the mileage they receive from the railroads when they run their cars over the line.

Q. I think you misunderstand my question. Does the tank line company pay any of its earnings to the Standard Oil Company as a commission for getting its business? A. Not one dollar.

Q. Would you care to state the salaries paid to the officers of this tank line company; are they large? A. I should say they are small. I should prefer not to say what my salary is or what the others are, but I would say they are not exorbitant. I am not afraid of its making too large a showing for the Union Tank Line Company, but I think they are small.

Q. The point is this: I think it has been testified to before this commission that in the opinion of several very prominent and highly respectable railroad men this rate of three-quarters of a cent a mile ought to be profitable for the owners of the cars, and the testimony that you have given here this morning seems to me remarkable; I have been trying to get at the disposition of the earnings of this company. A. If a car was continued in constant use throughout the year on long trips, it might be; but I tell you honestly that my statement that 4½ per cent is the average earnings on the investment of the Union Tank Line Company is the exact truth, without any manipulation of the books to make a salary or a big earning. We have been, for instance, in the last two years at an expense of $125 on each car for these automatic brakes, air brakes and the automatic couplers; and that $125 on each car does not bring us back one cent.

Q. Oh, that is probably true; in addition you testified that in your opinion there are conditions surrounding the use of these tank cars that would make the business of owning and operating them less profitable than the owning and operating of cars in use the year around? A. Yes.

Q. (By Mr. A. L. Harris.) What allowance is made by the Standard Oil Company to the Union Tank Line Company for hauling its oil? A. Nothing at all. The Union Tank Line Company gets its pay and its only pay from the railroads over whose lines the car travels.

Q. That is all the pay it gets? A. It pays none of its earnings to the Standard Oil Company, nor does the Standard Oil Company pay any of its earnings to the Union Tank Line.

Q. (By Representative Livingston.) The majority of the stock, I understand, of the Union Tank Line Company is owned by the principal owners of the Standard Oil Company; is that correct? A. I do not know in detail. I believe, and I have stated, that the owners

of the Union Tank Line Company and the owners of the Standard Oil Company are the same.

Q. What this commission seems to be trying to get at is why a corporation of that sort should be organized and run without a profit. Now, it seems to me that for some reason of their own, the large owners of this company have organized the Union Tank Line Company for the purpose of running that company in the interest of the Standard Oil Company, and they get their profits by way of dividends on the Standard Oil Company's stock; is not that really the relation? A. I have testified that I believe the owners of the two properties are the same, and that those gentlemen think that the ownership and the running of the tank cars is a necessary adjunct to their general business, and therefore they continue it.

Q. You probably are not in position to testify that they intend to earn that profit without making the profit directly out of that company, but to get their profits out of the other company? A. I can not say what their intentions are; I only know the result of the running of the Union Tank Line Company.

Q. Of course, there does not seem to be anything in connection with the Union Tank Line that is worth hedging about? A. There is not. The inference that Mr. Rice tried to draw and the statement that he made to the commission was that this mileage returned to us the cost of the car every three years. I say to you that for eight years that company has shown an average earning of 4½ per cent. Mr. Rice evidently intended to convey the impression that that mileage was unfair and unreasonable and intended as a freight discrimination on the Standard Oil Company's shipments; and I give you the results of the operations of that company to deny Mr. Rice's allegation.

Q. Do you know whether or not any of this stock is held by persons other than those who own Standard Oil Company stock? A. Yes, I do.

Q. You know that it is held by others? A. Yes.

Whereupon, at 1 p. m., the commission took a recess until 2 o'clock p. m.

The commission met at 2:10 p. m., pursuant to recess, Commissioner Clarke presiding.

(By Mr. Clarke.) The commission will be in order and the examination of Mr. Page will be resumed.

Mr. Howard Page again on the stand and examination resumed.

HOW MR. RICE GOT THE "TURN ANOTHER SCREW" LETTER.

Q. (By Mr. Smyth.) Mr. Chairman, I should like to ask Mr. Page a question. He has testified in reference to the Chess-Carley "turn another screw" letter to Mr. Culp, who was at that time general manager of the Louisville and Nashville railroad and is now traffic manager of the Southern. I want to ask Mr. Page if he knows how Mr. Rice came into possession of that original letter, written by Mr. Carley to Mr. Culp? A. My information and belief is that Mr. Rice, in making some shipments after the time of the shipment which was referred to in that letter, was charged the regular tariff rate, which all other shippers were paying and which was more than he paid on that shipment. He made a claim on the later shipment, claiming the same rate as had been paid on the shipment which Chess, Carley & Co. complained of. The claim was sent, as I understand, in the regular way to the railroads, and as is customary with railroads, the billing of the car and the correspondence in connection with the shipment were all gathered together in one folder and attached to the papers and the claim when it was returned to Mr. Rice with the claim refused. He got that letter in that way. It showed that the railroad people did not construe it in any such way as Mr. Rice has tried to put it, because if they had they certainly would not have sent it broadcast and attached it to their papers and sent them back to Mr. Rice.

Q. Mr. Culp, I believe, testified that he had never seen the letter personally? A. He testified in the proceedings before the Bacon committee in 1888 that he had never seen the letter, and if he had he would have understood it as it has been explained, that it was simply calling attention to an error, and that Mr. Hathaway used the same expression that was current in the Louisville and Nashville office when an error occurred, that the machinery was loose and ought to be tightened up.

Q. There was apparently no intent on the part of the Louisville and Nashville officials to suppress the letter or destroy it; it was handled in the ordinary course with papers in that case? A. Exactly. And I might further add that Chess, Carley & Co.'s offices in Louisville at the time that letter was written were at the corner of Fourth and Main streets, and the office of Mr. Culp was on the corner of Second and Main streets, two squares away; and I think if it had ever been intended that an order was to be given to the Louisville and Nashville road to advance rates in any such way as Mr. Rice tried to show, a letter would not have been written that had to go only two squares. It would have been attempted in some other way.

(By Mr. Clarke.) Mr. Page, you may resume where you left off.

"GHOST TRAINS."

Mr. Rice refers to ghost trains as a means of discrimination in favor of the Standard Oil Company. I wish to say that the Standard Oil Company has never shipped a pound of freight on such a train, even if there has ever been such a train in existence, which we doubt.

NEGOTIATIONS FOR SALE OF MR. RICE'S PROPERTY.

Mr. Rice states that Mr. F. B. Squire, of the Standard Oil Company of Ohio, made him an offer of $250,000 for his oil properties. I beg to offer an affidavit from Mr. Squire denying this, and affirming that Mr. Rice offered him his oil properties at one time for $24,000, and several years afterwards Mr. Rice again offered to sell his oil properties and stop prosecutions, etc., for the sum of $250,000; and offered to give Mr. Squire $50,000 of this sum if he could bring about this sale. In other words, Mr. Rice offered to pay a part of the money that he was to receive from

the Standard Oil Company to an employe of the Standard Oil Company if that employe could bring about the sale of the property to the Standard Oil Company.

(By Mr. Farquhar.) Had you not better read that affidavit?

Witness read the affidavit as follows:

"State of Ohio, County of Cuyahoga, ss:

"On this 1st day of December, 1899, personally appeared before me, F, B. Squire, who, being duly sworn, deposeth and saith that in the fall of 1876 I lived on Forty-second street, New York city, and while there I was introduced to Mrs. George Rice, who stated that her husband wanted to sell his oil property, consisting of production of crude oil, storage tanks for same, pipe lines, and refinery. The result of the conversation was a 30 days' option, which she secured for me to present to the Standard Oil people for $24,000 for the entire property, but it was promptly declined, they claiming it was only worth half the money. I so advised Mrs. Rice. She stated that the Standard Oil Company would be sorry.

"I met Mr. Rice several times after this, and he kept urging the matter. In the summer of 1881 or 1882 he invited me to meet him and his wife at Asbury Park. I did so. They there made me an offer to sell the property, stop all prosecutions, and be friendly with the Standard Oil Company for $250,000—$50,000 to go to me for my good office if I could bring it about. I reported the result to Mr. Archbold, including the offer to me, and it was immediately declined. I advised Mr. Rice, who called at my office the next day, and he stated that the company would regret this act. Immediately after this Mr. Rice published the pamphlet called 'Black Death.' F. B. SQUIRE.

"Sworn and subscribed before me the date aforesaid. F. W. LOTMAN,

"[SEAL.] *Notary Public.*"

Q. (By Mr. Farquhar.) Is there any way of impeaching the credibility of the man who makes this affidavit? (No answer.)

Q. (By Mr. Smyth.) Is he still in the employ of the Standard Oil Company? A. Yes.

Q. What position does he occupy? A. He is one of the officers of the Standard Oil Company of Ohio; whether vice president or treasurer, I do not recall; but he is an officer of the Standard Oil Company of Ohio.

Q. Occupying a position of trust and responsibility? A. Yes.

Q. He lives in Ohio? A. Yes.

Q. (By Mr. A. L. Harris.) Of the former Standard Oil Company of Ohio; have you a Standard Oil Company in Ohio now? A. Yes.

Q. Of Ohio? Of Ohio.

Q. Organized under the laws of Ohio? A. Yes.

Q. Doing business in Ohio? A. Yes.

Q. As such? A. Yes. He is the man Mr. Rice refers to as having made such an offer.

Q. (By Mr. Clarke.) Did Mr. Rice increase the capacity of his refinery and the value of his property between the times of those two propositions? A. I do not know.

NO FREIGHT CONCESSIONS IN VIOLATION OF THE INTERSTATE COMMERCE LAW.

In the foregoing I have tried to pick out and deny positively the different allegations made by Mr. Rice in regard to freight discriminations by various devices, which railroads, both prior to and since the passage of the interstate commerce law, have given to the Standard Oil Company against himself and other oil shippers. I would say that since July, 1889, as vice president of the Union Tank Line Company, I know the facts regarding the freight business of the Standard Oil Company, rates, shipments, etc., with the various roads of the United States. I wish to deny positively that during that time we have received any rebates or concessions from tariff rates contrary to either the letter or spirit of the interstate commerce law. While from Mr. Rice's testimony one might assume that the oil tonnage of the United States was about the only tonnage transported, yet the total consumption of oil in tons in the United States is less than one-half of one per cent of the total tonnage moved by the railroads of the United States, and it is absurd to either argue or conclude that so small a percentage of of the traffic moved by the railroads of the United States should be of such controlling influence over railroads and their officials as is so often alleged by Mr. Rice.

I wish to present a letter to Mr. Moseley, secretary of the interstate commerce commission, dated December 1, and his reply of December 6, 1899, in which he refers to the statistics compiled by the interstate commerce commission for the year ending June 30, 1898, showing that the tons carried by the railroads of the United States were 879,006,307 tons. The total consumption of petroleum produced in the calendar year 1898, from the very best sources that can be obtained, was a little less than 24,000,000 barrels; 24,000,000 barrels is equivalent to about 4,000,000 tons and 4,000,000 tons is less than one-half of one per cent of the total tonnage carried by the railroads.

"December 1, 1899.

"E. A. MOSELEY, Esq.,
"Secretary, Interstate Commerce Commission, Washington, D. C.

"Dear Sir: In the advance copy of your twelfth annual report, dated January 11, 1899, you give the earnings of the railways of the United States. On page 79 of this report you say that you have returns of 720 lines, representing 97 per cent of the operated mileage in the United States. You then show that of the earnings there was $874,865,487 received from freight service.

"Have you any tonnage figures showing the number of tons carried by the railroads which earned this $847,000,000? If so, I would be very much obliged if you would advise me of the number of tons (2,000 pounds to the ton) at your early convenience.

"Yours truly, HOWARD PAGE."

Interstate Commerce Commission,
"Office of the Secretary,
"Washington, December 6, 1899.

"MR. HOWARD PAGE,
"*26 Broadway, New York. N. Y.*

"Dear Sir: I beg to acknowledge the receipt of your letter of the 1st instant, requesting certain tonnage information bearing upon the freight earnings of railways as shown in the advance copy of the twelfth annual report of the interstate commerce commission. In reply, I would say that we have not the exact tonnage figures referred to, as such data are not compiled for the preliminary report.

"On page 67 of the advance copy of the 'Statistics of Railways in the United States' for the year ending June 30, 1898, tons carried as reported are shown as 879,006,307; tons carried one mile, 114,077,576,305.

"A copy of the volume referred to is sent you under a separate cover, page 67 of which is attached hereto.

"Very respectfully, EDW. A. MOSELEY, *Secretary.*"

Mr. Archbold filed here with you letters from about 20 of the principal railroads of the United States, in which, without exception, they stated that since the passage of the interstate commerce law, no concessions or allowances from tariff rates had been made to the Standard Oil Company in any manner or form. It is impossible to believe that men of the character of President Callaway, of the New York Central; President Newman, of the Lake Shore; President Mellen, of the Northern Pacific; Mr. A. J. Earling, vice president then and now president of the St. Paul road; President Burt, of the Union Pacific; and the chief traffic officials of lines like the Burlington, Pennsylvania, Baltimore and Ohio, Cleveland, Cincinnati, Chicago and St. Louis, Atchison, Topeka and Santa Fe, Southern Pacific, Louisville and Nashville, Boston and Maine, and other railroads whose letters were presented, would all unanimously state that we had obeyed the law, both in letter and spirit, if the facts were to the contrary.

We might be asked why (in view of the known fact that some of the railroads, since the passage of the interstate law have paid rebates to large shippers) we have not received same. We have not done so because, in the first place, it was against the law, and secondly, because we knew from past experience that if we received cut railroad rates other oil shippers would receive the same, and we felt, as we now feel, that from a business standpoint alone it has been, and is now, to our interest to have tariff rates maintained.

The Standard Oil Company does not need any freight advantages to maintain its business, and all it wants is to be required to pay the same rates of other oil shippers from and to the same points.

THE STANDARD'S ADVANTAGE IN HAVING MANY DISTRIBUTING POINTS—THE CONSUMER GETS THE BENEFIT.

In reference to Interstate Commerce Commissioner Prouty's remarks in regard to the Standard Oil Company, when Mr. Prouty appeared before the commission early in October, which testimony I heard: Commissioner Prouty's arguments seem to be to the effect that the Standard Oil Company had advantages by reason of having its refineries and distributing plants at Chicago and the Atlantic seaboard, as well as at Lima, Buffalo and other middle state points, as compared with a refiner who had his works only at Cleveland or in the Pennsylvania oil regions. We admit that by having refineries and distributing plants at Chicago for the west; at Buffalo, Lima and Parkersburg for the middle states and the south, and at the Atlantic seaboard for the east and New England, we have decided advantages over a refiner who has his works only at one point, and who tries to compete with us in selling oil throughout the country. We claim, however, that such an advantage is a fair one, and can not be overcome by any fair or reasonable adjustment of freight rates. We further claim that by having our refineries and distributing plants located at various points throughout the country we can and do distribute more cheaply and sell the oil at a less cost to the consumer, and it is more to the interests of the country at large for the consumer of oil to get it at a low cost than it is to try to fix freight rates on any basis that will permit one manufacturer at one point to distribute his products throughout the United States.

That, gentlemen, closes all that I have prepared. I am perfectly open and glad to answer any questions you gentlemen have.

ADVANCE IN CANADIAN FREIGHT RATES.

Q. (By Mr. Jenks.) We had some testimony here a little time ago with reference to the freight rates on American oils from the United States into Canada, in which it was said that very lately there had been a very decided increase in the freights on American oil going into Canada. This was thought to be much to the disadvantage of those who had to ship oil from the United States into Canada. Can you explain to us that matter of freight rates? A. I can say that I know there was an advance in rates from Detroit and Toledo and Buffalo and other frontier points on oil from the United States into Canada. I can further add that we pay those advanced rates and that we ship 80 per cent of the oil that is exported from the United Sates into Canada. We therefore pay four times as much as all the balance of the oil shippers together.

Q. What proportion of your sales in Canada are shipped from the United States, and what proportion are sales from the Canadian product? I understand that the Standard Oil Company owns practically all of the Canadian refineries. A. I do not so understand it, and I do not know the relative shipments from the United States compared with the consumption of oil manufactured in Canada. I do know, though, that shipments from the United States into Canada have increased in the last year; in fact, since that advance in rates as compared to the old situation.

Q. Do you know what proportion of the refining industry of Canada is owned by the Standard Oil Company? A. I do not; I do not know that the Standard Oil Company owns any interests in Canada.

PENDING SUITS FOR ALLEGED FREIGHT DISCRIMINATION; CHARGES ON OIL IN BARRELS.

Q. We have had some evidence with reference to suits that were brought against the railroads by independent refiners in western Pennsylvania, in which they claimed that the railroads had been dealing unfairly with them in the charging of freight rates—suits that are still pending—can you tell us anything with reference to those suits? A. I do know that several years ago—I do not recall how many—the interstate commerce commission decided that the weight of the barrel, when loaded with oil, should be carried by the railroad free. In other words, they should not charge for the barrel when it contained oil. An order was entered to that effect, which the railroads declined to obey. The interstate commerce commission have since that time gotten some evidence from the plaintiffs in that case as to the volume of their shipments in barrels within a certain period, and fixed the amount of damages which they claim the railroads should pay back to those shippers of oil in barrels. The railroads also declined to pay that, and that case is now, I believe, before the United States court in Pittsburg and is still pending. I would say in connection with it that at the time when the shipments were made in barrels by these plaintiffs and the rate of freight was charged on the weight of the wood, the Standard Oil Company was making shipments of oil in barrels and paying for the weight of the wood. In other words, there was no difference in the rule or the rate that was applied on the shipments of the plaintiffs and upon the shipments of the Standard Oil Company.

Q. Was this custom of the railroads one that was brought about in any way, to your knowledge, by the action of the Standard Oil Company officials? A. No.

Q. What was it? A. In the first decision of the interstate commerce commission in regard to the relative rates that should be charged on oil in barrels and oil in tank cars, the commission decided, by Judge Cooley, that the rate per 100 pounds in car loads, on oil in tank cars or on oil in barrels, including the weight of the barrels should be alike. The railroads adopted that order. Then on the second case, after Judge Cooley had left the bench, some other commissioner decided that the barrel should be carried free; and that the railroads declined to follow.

Q. The commission practically reversed its own decision? A. They tried to reverse their own decision before the United States circuit court in Pittsburg.

Q. I say practically reversed its former decisions? A. Yes.

Q. But it was under the first decision that the charges were made? A. Under the first decision that the charges were made.

THE MOST OF THE STANDARD'S OIL IS FINALLY DISTRIBUTED IN BARRELS.

Q. Do you recall what proportion of the shipments of the Sandard Oil Company at that time before the second decision was rendered, was in tank cars, and what in barrels? A. Your question involves the whole country, and I should say that the shipments, as a whole, of the Standard Oil Company in barrels exceed the shipments of the Standard Oil Company in bulk in tank cars. You must bear in mind that when the Standard Oil Company ships its oil in tank cars to a distributing station, it is barreled there to a very large extent, and it goes out in barrels, and it is a part of the barrel sales of oil. I think I am correct in that statement, and it is the best I can give; that is all.

Q. That is so at the present time? A. It is true still.

Q. (By Mr. Clarke.) Therefore, very much of the oil which is shipped is shipped part way in tanks and the rest of the way in barrels? A. It is. When it comes to local country points on the line of a railroad. The rule that the commission made there, if applied to oil, would naturally apply to every other package that might be put around any other commodity that was susceptible of any other mode of shipment.

Q. (By Mr. Smyth.) Lubricating oil, I suppose, is shipped in barrels, is it not? A. It is shipped in tank cars to some extent—yes.

SO FAR AS THE WITNESS' EXPERIENCE GOES, THE STANDARD NEVER DICTATED FREIGHT RATES TO BE CHARGED TO OTHER SHIPPERS.

Q. (By Mr. Phillips.) You admit, Mr. Page, that the Standard Oil Company did receive large rebates before the passage of the interstate commerce act? A. I admit that.

Q. From your knowledge and belief and information? A. My knowledge and belief and actual experience, Mr. Phillips, was that prior to the interstate commerce law we got as low rates as we could.

Q. That amounted to very considerable worth to the Standard Oil Company during that period, no doubt? A. It meant that we got lower than tariff rates, the same as all other shippers; not only shippers of oil, but all other people. We could get them and did get them. I can add this, that as far as my own experience goes, prior to the interstate commerce law, when we secured lower than tariff rates, it never was in any instance a part of an agreement what the railroads should charge. Any other oil shipper could get as low a rate as we could, or lower, if the railroad saw fit to give it. We attended simply to our own business.

Q. (By Mr. A. L. Harris.) That was the universal rule of the Standard Oil Company? A. Which?

Q. Not to interfere with the rates of any one else? A. I can only speak in that regard so far as my own knowledge goes, and so far as my own knowledge goes it is true.

Q. You do not know anything about the rule which seemed to have prevailed in what is known as the Marietta and Cleveland railroad, do you? A. I have no knowledge of that, sir. I believe that case has been fully explained, and prior to the interstate commerce law my residence and knowledge was confined to the business of the Standard Oil Company in Louisville—in Kentucky.

Q. The only reason that I asked that question was that you made your answer very broad. A. I answered from my own knowledge.

Q. (By Mr. Smyth.) Do you know of any other oil company besides the Standard Oil Company that re-

ceived rebates prior to the interstate law? A. I do, sir.

Q. You think, then, that it was the general custom, as far as your knowledge goes? A. I know it; and in some cases we found they had a lower rate than we had.

WHERE OTHER SHIPPERS GOT LOWER RATES THAN THE STANDARD.

Q. You believe, then, that it was the general custom prior to the passage of the interstate commerce law? A. That every shipper and others got the lowest rates they could from the railroads.

Q. (By Mr. Phillips.) Can you name any of those companies who received it? I am not doubting the truth of your statement. A. I know it was shown in some other cases that Scofield, Shurmer & Teagle, of Cleveland, had some lower rates than the tariff. It has been 10 years, Mr. Phillips, and I do not know that I can recall the names, but I recall very distinctly that in one instance it was shown that some large shippers of oil from Memphis to Nashville, out on the roads leading from there, had special rates as against—had lower rates than we were paying from the same points to the same points. We found it out because people were selling oil cheaper than we were at the same points.

DOES NOT BELIEVE THE STANDARD EVER RECEIVED A SHARE OF THE RATE PAID BY OTHERS.

Q. Do you know of any instance where there was a higher rate charged to the independent refiners than to the Standard, and that was divided between the Standard and the railroads? Is there any such testimony? A. I do not know of any instance. I will say no; I do not know of any case. In fact, I do not believe there ever was a case where the Standard Oil received from the railroad a share of the rate that was paid by independent shippers. I know it was not so in the territory which I had anything to do with, and it has never been so since I have been in New York.

DOES NOT KNOW.

Q. You are connected with the transportation and know something about the pipe line business also of the Standard Oil Company? A. No, sir; I know very little about pipe line matters.

Q. Do you know whether the Standard Oil Company ever placed a premium on oil in special fields where there were independnt pipe lines, and by this means caused them to suspend business or bought them out? A. I know nothing whatever as to any prices paid for crude oil.

Q. Or about the pipe line business in that regard? A. No, sir; I do not.

Q. Do you or do you not know whether the Standard Oil Company opposed, after having their pipe line to the seaboard, the passage of the free pipe line law in pennsylvania or in New Jersey? A. I know nothing whatever about it, sir.

Q. Do you know whether the Standard Oil Company opposed, directly or indirectly, the United States pipe line in securing the right of way through the state of New Jersey? A. I know nothing whatever about it.

Q. You do not know about that? A. No, sir. I am not connected with the pipe line department in any way.

Q. When independent companies shipped abroad did the Standard Oil Company ever obstruct ocean transportation in any way or obstruct them in getting ocean steamship service? A. Not to my knowledge, in any way.

Q. Have you knowledge or information as to the installation plants or receiving tanks in Germany or other countries? A. I have not, sir.

Q. Have you any information in regard to the agents who transferred and sold the Standard oil in foreign countries—Standard agencies abroad? A. I know there are some Standard agencies abroad; yes.

Q. Have you any information in regard to this: to a man in Germany, or who was in Germany, recently deceased, by the name of Poth, who handled oil of the independent companies in Germany? A. Never heard the name before, sir.

Q. You have no knowledge, then, of their purchasing all these installation plants abroad, almost wholly in Germany? A. I have no knowledge.

EXPORTS—PRICES HIGHER ABROAD.

Q. (By Mr. Kennedy.) Have you any knowledge of the relative value and prices of oil exported? A. I only know in a general way that the exports of petroleum products produced by the Standard Oil Company are in excess of their wells within the United States. In other words, a large share of the Standard Oil Company's business is outside of the United States.

In regard to the relative prices, I would say that the consumer of oil in the United States gets his oil for very much less than the consumer of that same oil abroad, and that is due principally to the fact that we have facilities within the United States for cheaply distributing the oil to the consumer that the company has not got on the other side. Mr. Rice refers to the price of oil at New York for export as compared with the price of oil in Montana and Idaho, and tries to convey the idea that we sell our oil abroad for less money than to the consumer within the United States. I submit that the price of export oil at New York is the price for cargoes at the mouth of the refinery, whereas the price of oil in Montana and Idaho must necessarily include expenses of distribution. The freight goes from Chicago, for instance, out to those western states, and comparing the price to the consumer of a barrel of oil out in the mountain districts of Idaho and Montana with the cargo of export oil at New York is manifestly unfair.

Q. Have you any knowledge of the Standard Oil Company selling oil in the German market below the point of profit for the purpose of driving other dealers out of that market and of their being curbed in that practice by the German government? A. I have no such knowledge, sir.

RUSSIAN OIL.

I have heard, and I believe, that the German government issued an order within the last year or so re-

quiring the railroads of Germany, which are under government control, to burn exclusively Russian oil and not American.

Q. (By Mr. Smyth.) Is it not a fact that the great competition you have in England is with the Russian oil, which is backed by the Rothschilds? A. The Russian field is a great competitor of the American petroleum field. The production of oil in Russia is, I believe, today equal to that of the United States, and at times has been in excess of it. In fact, I have known of reports of one well in Russia that has produced as much as 100,000 barrels per day, which is as much as the entire Pennsylvania oil field in certain sections, and the price, I do know, of Russian crude oil is very much lower than the price of American crude oil.

Q. (By Mr. A. L. Harris.) What about its quality? A. Its quality is not so good as the Pennsylvania oil. It is more like the Ohio crude.

Q. (By Mr. Phillips.) Do you know whether the Russian oil is extensively sold now in Germany? A. It is sold in Germany, and it is sold in Italy, and it is sold in England.

Q. Is it sold to any great extent in Germany? A. To as great an extent as they can sell it, sir.

OCEAN TRANSPORTATION—FOREIGN MARKETS AND AGENCIES.

Q. (By Mr. Farquhar.) Does the Standard Oil Company own its own ocean lines for transportation of oil to Europe? A. I am not very familiar with that part of it, Mr. Farquhar, but I know in a general way that they do own or have an interest in certain bulk tank ships and also some schooners. The tank ships are used for the transportation of the bulk oil from the United States to certain points in Europe where there are tank facilities for receiving it, and the ships are used for the purpose of shipment of case oil to the far east.

Q. Can you tell the commission how many countries in the world the Standard Oil Company sells its oil to? A. I think it would be easier to name those that we do not, or that we do not try to. I think we sell, sir, all over the world, as far as we can.

Q. Will you kindly state the means of transportation for the Asiatic trade? Is that by steamer or sail? A. By sail, usually, and against very severe competition of the Russians. They have tank steamers by which they transport oil from Batoum to India, and even to China and Japan.

Q. The statement has been made that the Standard has sold oil in foreign markets—in Asiatic countries—where they have had a return of only one-third of the price of the oil in the market itself. Do you know anything about that? A. I do not know as to that, sir.

Q. You know nothing about the price of oil and competition of other oils used in Asiatic countries? A. I only know we have shipped oil there, and still do, as against Russian competition. As to what the prices are there, I do not know. But I do know, from information and belief, as I have before stated, that the consumer of oil abroad pays much more for his oil than the consumer within the United States.

Q. (By Mr. Smyth.) Testimony has been given here that the Standard Oil Company has over 360 agencies throughout the world, every one of which is in charge of an American citizen. Do yo uthink that is correct? A. I do not know. I do know that we have many agencies, but how many I do not know. I do know in a general way that we send Americans to take charge of those departments, but how many there are I can not say.

Q. (By Mr. Phillips.) Do they exert a very considerable influence on our consuls abroad? A. I have no knowledge of it, sir.

THE STANDARD WOULD MAKE PRICES TO KEEP THE TRADE.

Q. You spoke some time ago of the advantage the Standard Oil Company has over others by having refineries at many different points in the United States in the lessening of freights, etc. There are quite a number of the independents that have such advantage, too, in localities; that have advantages, perhaps, over the Standard Oil Company in certain localities. Is it or is it not, has it or has it not been the practice of the Standard Oil Company where independent oil was being distributed to ship their oil in and sell it lower than the usual price or make it unprofitable for others? Do you know of any such instance as that? A. I can only say in a general way, Mr. Phillips, that we doubtless ship the oil from the nearest point and try to sell it.

Q. Do you know or do you not know that when the independent refineries recently began to distribute oil in New York the Standard dropped prices very greatly so as to make it unprofitable? A. I do not know that, sir.

Q. Or Philadelphia? A. I do not know it.

Q. (By Mr. Jenks.) You said a moment ago that of course—— A. (Interrupting.) It goes without saying that we are in the business and we try to keep our trade, and we make prices that will also keep it.

Q. So, speaking generally, you would presume it was true that competitive prices are lower than where you have no competition? A. To a reasonable degree, yes; but I will say that the object and the success of the Standard Oil Company has been due to the fact that their effort is continually to reduce the cost of manufacturing and distributing of oil; and we sell it as cheaply as we can, based on that cost, to the consumer, and thereby increase the volume of our business by cheapening the cost to the consumer.

STATEMENTS FURNISHED TO THE COMMISSION.

Q. (By Mr. Phillips.) I am informed that the independent companies have recently made a statement of their business affairs to this commission through Professor Jenks. Would you be willing to advise the Standard Oil Company to make such a statement of their business? A. I do not know what kind of a statement the independent people have made, and I would not take it upon myself to do so. I think it would be rather impertinent for me, as a subordinate, to advise the officials in charge of the Standard Oil Company matters what kind of a report they should make.

THE TEXAS OIL FIELD.

Q. (By Mr. Kennedy.) I should like to ask you something about the new Texas oil field. Does the Standard Oil Company own that field, and where is the product refined, and to what part of the country is it shipped? A. I do not know that the Standard Oil Company owns that field. I know there is a refinery at Corsicana, Tex.

Q. A Standard refinery? A. It is not known in any way as the Standard Oil Company, and I do not know that it is.

Q. (By Mr. A. L. Harris.) I understood the witness to say that he knew of no instance in which the Standard Oil Company had interferred in any way or concerned themselves in any way with what other companies might get in the way of rebates, etc. Is that true? A. I said that no arrangement prior to the interstate commerce law, through which we got lower than tariff rates, was predicated in any way upon what that same railroad should give in the way of rates or rebates to other oil shippers.

Q. Do you know anything about the case of Handy and another, trustee, against the Cleveland and Marietta Railroad Company? A. I do not.

Q. Would you care to have the syllabus of that case read so as to get in the evidence? A. As I have no knowledge of it, Mr. Harris, I do not know what my testimony would be worth on the subject.

Q. It would be merely to show that your statement in regard to the action of the Standard Oil Company against other companies was probably not entirely correct? A. I, of course, can speak and only speak of my own knowledge, and my knowledge in the time prior to the passage of the interstate commerce law was confined to the Louisville business and south.

Q. You desire to have your testimony limited to your own knowledge, and not to be broader than your own knowledge? A. I supposed that went without saying.

Q. I would like, for the benefit of the commission, to read the syllabus:

["Circuit Court, S. D. Ohio, E. D., 1877.]

1. RAILROAD COMPANIES—RECEIVERS—DISCRIMINATIONS.

"The receiver of an insolvent railroad company can not unjustly discriminate in the charges imposed upon rival shippers over his road in order to increase his revenues, and, if guilty of discrimination, may be removed by the court therefor.

2. SAME—REMOVAL.

"The Standard Oil Company having threatened to store its oil until it could lay a line of pipes to Marietta, unless the receiver of a railroad company should give a special rate, the receiver agreed to carry its oil at 10 cents per barrel, to charge rival shippers 35 cents per barrel, and to pay 25 cents per barrel of the sum collected from rival shippers to the Standard Oil Company. *Held* to be such gross and wanton discrimination on the part of the receiver as to require his removal."

This is on page 575, Trust Proceeding of 1888.

(Testimony closed.)

SUPPLEMENTARY EVIDENCE.

AFFIDAVIT OF GEORGE RICE IN REBUTTAL OF HOWARD PAGE.

City, County, and State of New York, ss.

On this 2d day of January, 1900, personally appeared before me George Rice, of Marietta, Ohio, who, being duly sworn, doth depose and say:

That he had read the affidavit of one F. B. Squires, the secretary of the Standard Oil Company of Ohio, which was presented to your commission by Howard Page December 13, 1899. In answer thereto I most positively and unequivocally deny that in 1876, or at any other time, I offered or included my producing properties and pipe lines in the proposed sale of my oil properties for the sum of $24,000.

The real truth of the matter is that in the year 1876 Mrs. Rice and myself were boarding in New York at the same place with Squires, and Mrs. Rice was acquainted with a Mrs. Waring, who was also an acquaintance of Squire. That in some conversation with Mrs. Waring the matter of the oil business came up between them, and subsequently the said Squire spoke to deponent about his oil interests, and said he could possibly sell some of it to the Standard Oil Company, if he was so disposed to part with it. That the result of several conversations was that deponent informed Squire that if he or the Standard Oil Company desired to purchase my refining plant (which was only a small part of my entire oil properties and interests in the oil or petroleum business) he or it could have the same for $20,000, as my wife was very desirious that I should get out of the refining business, and it was finally offered to Squire for that sum, which was not accepted.

In the summer of 1882 I was stopping with my wife at Asbury Park, where Squire, on his own solicitation, came to see me and he then and there offered me $250,000 for my entire oil properties, including production, pipe lines, storage tanks, and refinery plant. I never offered the said Squire the sum of $50,000 commission or any other sum to make said sale; nor did he suggest it or demand it, or any other sum whatever, nor did I say to him that the company would regret their act if they did not purchase from me, nor was I ever aware that said Squire had an office, except by hearsay, at Cleveland, Ohio. As this latter alleged interview occurred in the summer of 1882, as I testified before your commission, and as my pamphlet, Black Death, was published on December 15, 1881, it is superfluous to swear to it, that, because said proposition was not accepted by said Standard Oil Company, I immediately published said pamphlet as retaliatory against said company.

I further solemnly deny, as stated by said Squire, that I several times thereafter urged the matter further with him in any manner whatever.

I also further most solemnly and emphatically deny that either Mrs. Rice or myself ever said to said Squire, or to any other person or persons whomsoever, that the Standard Oil Company would be sorry, or any similar words or of like effect.

On November 13, 1889, before Justice Morgan J. O'Brien, at a special term of the supreme court of New York city, I testified as follows:

"I made that offer of $250,000 to Mr. Squire, who represented the Standard Oil Company—the Standard Oil Trust—in some capacity; his name is F. B. Squire, I think; I don't know when I made that offer to him; some four or five years ago; I can't recollect just the time; I was stopping at Asbury Park with my wife, and he came there as their representative, I suppose, *and made that offer to me.* I don't know how long my price remained at $250,000."

I had previously made this same offer to Mr. Squire, and he came down there to buy said properties at a less price, and finally offered me $250,000 therefor, which I rejected.

When I testified to above, John D. Archbold, a trustee of the Standard Oil Trust, was present and heard said testimony, and when he followed me on the stand he did not allude to or in any manner contradict my said testimony; moreover, at this time Mr. Archbold testified as follows:

"I know Mr. George Rice, the plaintiff. I remember an interview with him in the month of October, 1886, in which he proposed to dispose of his property and all his future time of service or absence from service, and that conversation is fresh in my recollection.

"After the ordinary commonplaces we came to a discussion of the property question as owned by him, and he expressed his willingness to dispose of the property and business —the refinery property, I should say.

"There was no reference made at that interview, nor at any time in my conversation with Mr. Rice, to the producing property, and I never heard of it until now. He gave me a rough description of the refinery which I might know of, and told me of the volume of business which he had done the preceding year and which he was capable of doing ,and came to the point of fixing his price."

This deponent further says that he incorporates herein the above portion aforesaid testimony of Archbold's as a corroboration of this affidavit, and a contradiction of the affidavit of said Squire, that my producing properties and pipe lines were all to be included in the original offer for the insignificant sum of $24,000, while Archbold in 1889 swears, "I never heard of it."

GEO. RICE.

Sworn to before me this 2d day of January, 1900.

J. WILLIAM HILL,
Commissioner of Deeds, New York City.

JOHN D. ROCKEFELLER.

Answers to interrogatories.

1. Q. What was the first combination in which you were interested of different establishments in the oil industry? A. The first combination of different establishments in the oil industry in which I was interested was the union of William Rockefeller & Co., Rockefeller & Andrews, Rockefeller & Co., S. V. Harkness, and H. M. Flagler, about the year 1867.

2. Q. What were the causes leading to the formation? A. The causes leading to its formation was the desire to unite our skill and capital in order to carry on a business of some magnitude and importance in place of the small business that each separately had heretofore carried on. As time elapsed and the possibilities of the business became apparent, we found further capital to be necessary, obtained the required persons and capital, and organized the Standard Oil Company with a capital of $1,000,000. Later we found more capital could be utilized and found persons with capital to interest themselves with us, and increased our capital to $3,500,000. As the business grew and markets were obtained abroad, more persons and capital were added to the business, and new corporate agencies were obtained or organized, the object being always the same, to extend our business by furnishing the best and cheapest products.

3. Q. Did the Standard Oil Company or other affiliated interests at any time before 1887 receive from the railroads rebates on freight shipped, or other special advantages? A. The Standard Oil Company of Ohio, of which I was president, did receive rebates from the railroads prior to 1880, but received no special advantages for which it did not give full compensation. The reason for rebates was that such was the railroads' method of doing business. A public rate was made and collected by the railway companies, but so far as my knowledge extends, was never really retained in full, a portion of it was repaid to the shippers as a rebate. By this method the real rate of freight which any shipper paid was not known by his competitors nor by other railway companies, the amount being in all cases a matter of bargain with the carrying company. Each shipper made the best bargain he could, but whether he was doing better than his competitor was only a matter of conjecture. Much depended upon whether the shipper had the advantage of competition of carriers. The Standard Oil Company of Ohio, being situated at Cleveland, had the advantage of different carrying lines, as well as of water transportation in the summer, and taking advantage of those facilities made the best bargain possible for its freights. All other companies did the same, their success depending largely upon whether they had the choice of more than one route. The Standard sought also to offer advantages to the railways for the purpose of lessening rates of freight. It offered freights in large quantity, carloads and trainloads. It furnished loading facilities and discharging facilities. It exempted railways from liability for fire. For these services it obtained contracts for special allowances on freights. These never exceeded, to the best of my

present recollections, ten per cent. But in almost every instance it was discovered subsequently that our competitors had been obtaining as good, and, in some instances, better rates of freight than ourselves.

4. Q. If so, in what years were these advantages largest, and from what roads were they received? A. To the best of my recollection the greatest rebates were paid from 1877 to 1879. During that time we had an agreement for a special ten per cent commission. I think that agreement was made with the Pennsylvania, the Erie, and the New York Central roads. Large rebates were also paid during the summer of 1878, amounting I believe to 64½ cents on refined oil to equalize eastern shipments by rail with shipments by Erie canal. But these rebates were paid to all who shipped by rail. They were not discriminatory rates. I am not sure now whether any other road than the Pennsylvania collected the full amount and paid these rebates. The Erie and New York Central made the same reductions in rates to meet canal shipments, but my impression is that the Erie at least did not collect the higher rate from shippers and rebate it as did the Pennsylvania.

5. Q. About what percentage of the profits of the Standard Oil Company came from special advantages given by the railroads when these were greatest? A. No percentage of the profits of the Standard Oil Company came from advantages given by railroads at any time. Whatever advantage it received in its constant eflorts to reduce rates of freight was deducted from the price of oil. The advantages to the Standard from low freight rates consisted solely in the increased volume of its business arising from the low price of its products.

6. Q. Did the Standard Oil Company or any of its affiliated companies ever receive, under any name whatever, any income from any railroad for oil shipped over those roads by any of its competitors? If so, give particulars. A. I know of no such instance. It seems that some arrangement of that nature was entered into by one of our agents in Ohio, being the same case which has been testified to by George Rice. When notice of this agreement was brought to the officers of the company for which it was made it was promptly repudiated, and the money received, some small amount, I think under $300, was refunded. And this was not done because of any action in court or judicial opinion, but promptly as soon as reported, and before we had any knowledge of judicial proceedings.

7. Q. Has the Standard Oil Company received any financial favors from any railroad since 1887? A. To my knowledge, none whatever.

8. Q. Has the ownership of stock in railroad companies by officers of the Standard Oil Company given the Standard advantages with those railroads over its competitors? If so, give particulars. A. It has not. Stockholders and officers of the Standard have invested in stocks of railroad companies. But in no instance have they done so for the purpose of influencing the policy of the railway companies, nor to the best of my knowledge and belief has any attempt ever been made through such ownership to influence any railway in favor of the Standard.

9. Q. To what advantages, or favors, or methods of management do you ascribe chiefly the success of the Standard Oil Company? A. I ascribe the success of the Standard to its consistent policy to make the volume of its business large through the merits and cheapness of its products. It has spared no expense in finding, securing and utilizing the best and cheapest methods of manufacture. It has sought for the best superintendents and workmen and paid the best wages. It has not hesitated to sacrifice old machinery and old plants for new and better ones. It has placed its manufactories at the points where they could supply markets at the least expense. It has not only sought markets for its principal products, but for all possible by-products, sparing no expense in introducing them to the public. It has not hesitated to invest millions of dollars in methods for cheapening the gathering and distribution of oils by pipe lines, special cars, tank steamers, and tank wagons. It has erected tank stations at every important railroad station to cheapen the storage and delivery of its products. It has spared no expense in forcing its products into the markets of the world among civilized and uncivilized. It has had faith in American oil, and has brought together millions of money for the purpose of making it what it is, and holding its markets against the competition of Russia and all the many countries which are producers of oil and competitors against American oil.

10. Q. What are, in your judgment, the chief advantages from industrial combinations—(a) financially to stockholders; (b) to the public? A. All the advantages which can be derived from a co-operation of persons and aggregation of capital. Much that one man can not do alone two can do together, and once admit the fact that co-operation, or, what is the same thing, combination, is necessary on a small scale, the limit depends solely upon the necessities of business. Two persons in partnership may be a sufficiently large combination for a small business, but if the business grows or can be made to grow, more persons and more capital must be taken in. The business may grow so large that a partnership ceases to be a proper instrumentality for its purposes, and then a corporation becomes a necessity. In most countries, as in England, this form of industrial combination is sufficient for a business co-extensive with the parent country, but it is not so in this country. Our Federal form of government, making every corporation created by a State foreign to every other State, renders it necessary for persons doing business through corporate agency to organize corporations in some or many of the different States in which their business is located. Instead of doing business through the agency of one corporation they must do business through the agencies of several corporations. If the business is extended to foreign countries, and Americans are not today satisfied with home markets alone, it will be found helpful and possibly necessary to organize corporations in such countries, for Europeans are prejudiced against foreign corporations as are the people of many of our States. These different corporations thus become co-operating agencies in the same business and are held together by common ownership of their stocks.

It is too late to argue about advantages of industrial combinations. They are a necessity. And if Ameri-

cans are to have the privilege of extending their business in all the States of the Union, and into foreign countries as well, they are a necessity on a large scale, and require the agency of more than one corporation. Their chief advantages are:

(1) Command of necessary capital.

(2) Extension of limits of business.

(3) Increase of number of persons interested in the business.

(4) Economy in the business.

(5) Improvement and economies which are derived from knowledge of many interested persons of wide experience.

(6) Power to give the public improved products at less prices and still make a profit for stockholders.

(7) Permanent work and good wages for laborers.

I speak from my experience in the business with which I have been intimately connected for about 40 years. Our first combination was a partnership and afterwards a corporation in Ohio. That was sufficient for a local refining business. But dependent solely upon local business we should have failed years ago. We were forced to extend our markets and to seek for export trade. This latter made the seaboard cities a necessary place of business, and we soon discovered that manufacturing for export could be more economically carried on at the seaboard, hence refineries at Brooklyn, at Bayonne, at Philadelphia, and necessary corporations in New York, New Jersey, and Pennsylvania.

We soon discovered as the business grew that the primary method of transporting oil in barrels could not last. The package often cost more than the contents and the forests of the country were not sufficient to supply the necessary material for an extended length of time. Hence we devoted attention to other methods of transportation, adopted the pipe line system, and found capital for pipe line construction equal to the necessities of the business.

To operate pipe lines requires franchises from the States in which they were located, and consequently corporations in those States, just as railroads running through different States, are forced to operate under separate State charters. To perfect the pipe line system of transportation required in the neighborhood of fifty millions of capital. This could not be obtained or maintained without industrial combination. The entire oil business is dependent upon this pipe line system. Without it every well would shut down and every foreign market would be closed to us.

The pipe line system required other improvements, such as tank cars upon railways, and finally the tank steamer. Capital had to be furnished for them and corporations created to own and operate them.

Every step taken was necessary in the business if it was to be properly developed, and only through such successive steps and by such industrial combination is America today enabled to utilize the bounty which its land pours forth, and to furnish the world with the best and cheapest light ever known, receiving in return therefor from foreign lands nearly $50,000,000 per year, most of which is distributed in payment of American labor.

I have given a picture rather than a detail of the growth of one industrial combination. It is a pioneer, and its work has been of incalculable value. There are other American products besides oil for which the markets of the world can be opened, and legislators will be blind to our industrial interests if they unduly hinder by legislation the combination of persons and capital requisite for the attainment of so desirable an end.

11. Q. What are the chief disadvantages or dangers to the public arising from them? A. The dangers are that the powers conferred by combination may be abused; that combinations may be formd for speculation in stocks rather than for conducting business, and that for this purpose prices may be temporarily raised instead of being lowered. These abuses are possible to a greater extent in all combinations, large or small, but this fact is no more of an argument against combinations than the fact that steam may explode is an argument against steam. Steam is necessary and can be made comparatively safe. Combination is necessary and its abuses can be minimized; otherwise our legislators must acknowledge their incapacity to deal with the most important instrument of industry. Hitherto most legislative attempts have been an effort not to control but to destroy; hence their futility.

12. Q. What legislation, if any, would you suggest regarding industrial combinations? A. First. Federal legislation under which corporations may be created and regulated, if that be possible. Second. In lieu thereof, State legislation as nearly uniform as possible encouraging combinations of persons and capital for the purpose of carrying on industries, but permitting State supervision, not of a character to hamper industries, but sufficient to prevent frauds upon the public. JOHN D. ROCKEFELLER.

State of New York, County of New York, ss:

I swear that these statements made by me of my own knowledge are true, and that all other statements I believe to be true. JOHN D. ROCKEFELLER.

Sworn and subscribed to before me this 30th day of December, 1899.

S. MARSHALL BUSSELLE,
Notary Public, No. 190.

INFORMATION FURNISHED BY MR. S. C. T. DODD.

S. C. T. Dodd, solicitor of the Standard Oil Company, furnishes the following additional facts in reply to schedule of questions:

Q. What patents, machines, or processes of any kind formerly used exclusively by one plant are now used by all adapted to use them? A. The following is no doubt an incomplete, but as full as we can now supply, list of patents, by patent numbers, belonging to the various companies in 1882, the use of which was open to all. The subject of the patent is given when known: 9406, 104747, 146946, seaming machine; 146947, seaming machine; 148748, machine for stamping and bending sheet metal; 149516, sheet metal seaming machine; 150352, soldering iron heater; 150606,

apparatus for the distribution of liquid fuel; 150607, can-seaming machine; 150887, machine for uniting tinned plates by heat and pressure; 151155, apparatus for uniting tinned plates; 151619, apparatus for heating soldering irons; 152862, 154077, 154877, 155320, 158117, 158119, 165362, soldering apparatus; 167356, apparatus for facilitating the filling, etc., of cans; 169372, liquid-fuel burners; 171164, oil can nozzles; 177553, apparatus for facilitating the conveyance and delivery of boxes; 179135, box nailing machines; 182470, apparatus for facilitating the examination and packing of cans; 185777, machines for nailing boxes; 191172, sheet metal can machines; 192,278, feeding mechanisms for nailing machines; 194168, 203073, 224843, 227823, 227824, 227825, 227826, 227829, 228553, 228554, 230962, 334423, 234803, 234424, 236499, 239981, 240176, 240331, 240332, 240333, 240923, 240936, 240937, 239618, 3365, design for can; 7609, 23735, seaming machine; 23736, corrugating sheet metal; 24482, powder kegs; 38974, sheet metal can; 39616, soldering cans; 40661, sheet metal can; 42355, tin cans; 43326, cans for paint and fruit; 43371, sheet metal cans; 43079, molding sheet metal; 81692, sheet metal can; 82481, bending tops and bottons; 82766, sheet metal cans; 86571, sheet metal cans; 87692, seaming machine; 87704, soldering machine; 88410, soldering machine; 89431, soldering machine; 91248, machine for metal cans; 192446, sheet metal cans; 87485, improvement in the manufacture of lubricating oils from petroleum; 87658, improved process of preparing petroleum to be used in lubricating wool; 68974, improvement in stills for refining and distilling oils; 85810, 86535, 137157, 5570, 6871, 7095, improvement in burning heavy hydro-carbon oils; 7996, improvement in manufacturing of hydro-carbon oils; 7155, 8373, 8374, 43157, 50935, 66594, 79661, 113795, 124917, 148075, piston balance valve for steam engines; 163710, helicat-cone suction fans; 181814, apparatus for purifying paraffin; 182169, apparatus for the separation of petroleum products; 183909, balanced slide valves; 191430, metallic cartridges; 200310, 211761, 212562, 217063, 229962, 223549, 229297, 255861, method and apparatus for glueing barrels; 237130, horizontal hoop-driving machine; 219228, improvement in barrel-trussing machines; 4920, 5053, 5652, 7321, 7322, 9017, 37798, 42671, 44258, 47082, 59780, 58021, 68426, 77959, license under Cheeseborough patent; 99500, 174506, process for determining the grade of lubricating oils; 212914, 2960, 4366, 4367, 4375, 32568, 53539, 120539.

Q. What by products, if any, are available to your organization which could not profitably be made by separate plants? A. All products are made by separate plants, but most of them were at one time protected by patents, the use of which became available to all plants.

Q. Has there been under the organization any specialization of the plants, further than at time of the organization, giving to each the work for which it is best adapted? Give details, if any. A. Some of the corporations whose stocks were taken into the original trust were abandoned because of location or ill adaptation for the desired work. Others were organized at more convenient locations and with superior plants. Those manufacturing oil for export are located at tide water, while those for domestic trade are located at central shipping points in the interior.

Q. Have any plants or offices of the original organization been closed, shut down, suspended, dismantled or sold out? If so, give list, with disposition made of each. A. No plants or offices of the organization have been closed or sold out. But in the 18 years all plants of companies have been made new and more effective, and plants have been abandoned at one place because of more effective plants erected in a more suitable place. I am unable to give the particulars of the changes for 18 years; suffice it to say that almost nothing now remains of plants of 18 years ago.

Q. Are your prices, in fact, the same throughout the United States, allowing for cost of transportation? A. Yes.

Q. Are they, in fact, the same in the United States as in foreign countries, allowing for cost of transportation? A. Somewhat lower in the United States.

Q. Have your agents ever authority to make, or have they ever in fact made, lower prices or rebates in special sections of the country? A. No authority.

Q. Have they done so for the purpose of meeting competition or otherwise? A. No doubt prices have been cut to meet lower prices made by competitors.

Q. What dividends have you declared? Give complete list, with dates. A. Dividends were paid quarterly and have aggregated per annum as follows:

	Per Cent.		Per Cent.
1882	5.25	1891	12
1883	6	1892	12.21
1884	6	1893	12
1885	10.50	1894	12
1886	10	1895	17
1887	10	1896	31
1888	11.50	1897	33
1889	12	1898	30
1890	12		

Q. Give list of stock dividends, with dates. A. May, 1887, 20 per cent.

Q. What was the total amount of net profit, or loss, during your last business year? A. Profit, 30 per cent.

Q. What distinctions, if any, are made in the distribution of profits between the former owners of closed or dismantled plants and others? A. None.

Q. What sums have been added in enlargement or improvement of plant? Specify the use. Give particulars, with dates. A. In 1882 the property of the various companies was estimated to aggregate $75,000,000, for which amount trust certificates were issued. In 1882 they were estimated to aggregate $121,631,312. This increase was partly from profits, partly from additional capital invested. Possibly 50 per cent of the addition was profit. No estimate has since been made, but the addition of profits to capital was in about the same proportion until 1896, since which time profits have been divided. The improvements are in the way of greater efficiency in method and in facilities for enlarged output.

Q. What has been allowed for annual depreciation? A. An average of 5.77 per cent.

Q. What disposition has been made of plants closed or dismantled since the formation of the organization? List, with particulars of each. A. All that was useful of closed or dismantled plants was used in construction of new plants; all else was sold as junk. No data are within my knowledge or control from which particulars can be given.

Q. Give any further particulars which show the work of the organization and its effects. A. About the year 1872 the condition of the refined oil business was disastrous, and failures were of constant occurrence. Leading refiners began to combine for the purpose of making the business successful. The combination was by means of purchase of stocks and interests of various companies, and until 1872 the combination was solely by stock ownership in the hands of a limited number of individuals, who controlled the corporations as agencies in a common business. In 1882 these owners, whose names appear in exhibit A, entered into the trust agreement. The companies whose stock they owned in whole or in part, appear in the same agreement. They were not then competing companies. The individuals named as trustees controlled them by virtue of absolute ownership of a majority of their stocks. When the trust was dissolved in 1882 the same fact existed. The individuals then trustees continued to control the companies by virtue of absolute ownership of a majority of their stocks. Consequently the corporations named have been, many of them since 1872, separate agencies carrying on business as a unit for the individuals who are their common stockholders. What they have accomplished in that time may be thus briefly summarized:

1. They have cheapened transportation, both local and to the seaboard, by perfecting and extending the pipe line system; by constructing and supplying cars by which oil is shipped in bulk; by building tanks for storage of oil in bulk; by purchasing and perfecting terminal facilities for receiving, handling and reshipping oils; by purchasing and building steamers and lighters for river and harbor service; by building wharves, docks and warehouses for foreign shipments; by purchasing and building ocean steamers for carrying oil in bulk, and by employing in foreign countries the same special methods for storing and transporting oils in bulk, by which means alone the markets of Europe are today held for American oil against Russian competition.

2. By uniting capital, skill and acts, and the various processes and patents of a number of persons, as well as their secret processes, and by building up manufactories on a more extensive and perfect scale, with improved machinery and appliances, and by locating them in the centers of the trade they were intended to reach, the manufacture of oil has been much cheapened and improved.

By spending large sums in the investigation of methods of utilizing Ohio and Indiana oils, and by purchase of various patents they have succeeded in making a superior article of illuminating oil out of what for some years seemed an almost worthless product.

3. By uniting with the business of transporting and refining businesses necessarily collateral thereto, to-wit, the manufacture of barrels, tin cans, boxes for inclosing cans, paints, glue, sulphuric acid, etc., and by union of capital and skill obtaining the best machinery and manufacturing on a large scale, they have cheapened these products.

4. They have obtained and utilized the best skill in investigating and experimenting upon the obtaining of new and useful products from petroleum, and have cheapened illuminating oil and otherwise benefited mankind by the utilization of these by-products.

5. They have used their united capital in opening up the markets of the world for American petroleum, and have held those markets against the fiercest foreign competition. This was rendered possible only by the employment of millions of capital, in the cheapening of transportation at home, across the ocean, and in foreign lands, and by the best and cheapest methods of manufacture.

The proofs of these propositons will be found in the statistics of petroleum, showing its production, prices of crude and refined, consumption at home, and amount exported to foreign markets. While the Standard does not produce, refine and market all the oil, it has been the leader in the business, and competitors have succeeded by uniting their capital, skill and acts and following the same methods.

It may be asked whether all this could have been accomplished without combination. It could if one man could have commanded the necessary capital and employed the proper means and persons. But that was manifestly impossible. It could have been accomplished by one corporation instead of many, but no charter could be obtained authorizing a corporation at once to produce, manufacture, transport by pipe line, car and steamer, and deal in oils, and also to manufacture packages, acids, etc. The theory of the combination was that a corporation created by and largely doing business in a state should take its charter from that state. Until charters can be granted by the Federal government the agency of different corporations will be required in any business like that of American petroleum, which seeks all the markets of the world.

September 18, 1899. S. C. T. Dodd.

AFFIDAVIT OF HENRY DEMAREST LLOYD.

Author of Wealth Against Commonwealth.

Henry Demarest Lloyd being sworn and shown the following statement made by Mr. John D. Archbold before the Industrial Commission—

"I desire to say a word regarding the effort at pathetic reference of Mr. Lockwood to the Rice case in Mr. Lloyd's book. I desire to characterize this statement in Mr. Lloyd's book, as well, indeed, as all other statements with reference to our business as cunning fiction, made up entirely on one-sided testimony and dressed for sale. Whether Mr. Lloyd expected to share, as a result of his advocacy of Rice, in what Mr. Rice might be able to get from us, I am unable to say, but he certainly lays himself open to that suspicion.

"I desire to say further with reference to this book

of Mr. Lloyd's, that if you are disposed to waste your time reading it you will find it, with reference to its statements regarding the business of the Standard Oil Company, one of the most untruthful, distorted compilations that was ever inflicted upon a suffering public.

"Q. (By Mr. Farquhar.) Will you state the title of the book? A. Wealth vs. Commonwealth."—

makes deposition as follows:

That he is the author of Wealth Against Commonwealth.

That the main and central statements of Wealth Against Commonwealth are:

First. That certain men, now commonly known as the Standard Oil Company, entering the oil business before and after 1872, with no more capital and business experience than men already successfully established in the business, were declared by judicial and legislative investigations by the state and national governments to have obtained in a few years after 1872 a controlling and monopolistic position in the great oil industry.

Second. That judicial decisions and formal reports of legislative investigations declare them to have done this largely by making with the railways secret and unlawful contracts, by which their competitors and the people at large were denied the protection of competitive markets for buying and selling and deprived of their right to work at the occupation of their choice, and were forced to abandon their efforts in the oil industry to provide a livelihood for themselves and their families. After taking 3,700 pages of evidence and sitting for months, the railroad investigating committee of 1879 of the New York legislature said in their report: "The history of this corporation is a unique illustration of the possible outgrowth of the present system of railroad management in giving preferential rates, and also showing the collossal proportions to which monopoly can grow under the laws of this country. * * * The parties whom they have driven to the wall have had ample capital and equal ability in the prosecution of their business in all things save their ability to acquire facilities for transportation."

Third. That this success of the oil monopoly has encouraged the formation of other monopolies by similar means, filling the minds of the people with alarm and threatening not only the prosperity, but the peace of the country.

Deponent further swears that his account of these matters in Wealth Against Commonwealth makes no claim to be the result of original investigation, nor personal knowledge, but is in all things essential and controversial a transcription from the documentary records of state and Federal courts, civil and criminal, of legislatures, of congress, of the interstate commerce commission and of sworn testimony given in legal proceedings and official inquiries, corrected by rebuttal of testimony and cross examination, with no changes in substance and no changes in form other than those necessary for such condensation and simplification as make the transcription intelligible to the common people.

He further swears that in giving the public the particulars on which the official verdicts have been found his account is so far from being "one sided" that in less than 500 pages it contains more than 200 quotations, some of them nearly a page in length, from the testimony and statements in behalf of the members of the oil monopoly, and that in all cases he has indicated the nature of their defense, so much so that what is pertinent in the replies to him which have been made for them will be found to have already been given by him in Wealth Against Commonwealth.

Deponent further says that every controversial statement made by him is supported by exact references, by page and volume, to the official sources of information on which it is based; that in the five years which have elapsed since the appearance of the book it has not been shown that his conclusions have gone beyond the decisions or the testimony on which they are based, nor has the accuracy of his quotations and condensations been disproved.

Deponent further points out, in answer to the charge of "one sided testimony" that the selection of the testimony was not his work, but that of courts and legislative committees which, after hearing both sides on direct and cross examination, chose the "one side" which was to be believed. Deponent believes he would have been entirely within his legal and literary rights in accepting this "one-sided testimony" as the testimony officially and judicially attested and approved. But the deponent points out that, though he would have been justified in disregarding the testimony of the other side, as these public authorities disregarded it after hearing it, he has not done so, but in all cases has made sufficient reference to and frequent quotations from this testimony on the other side.

The deponent, in answer to the characterization of "all" of the statements of Wealth Against Commonwealth as "cunning fiction, made up entirely on one-sided testimony and dressed for sale," refers to his verbatim quotations from the many decisions of the supreme court of Ohio and supreme court of New York, the Federal court of the southern district of Ohio, decisions of the interstate commerce commission, of the criminal court of oyer and terminer of Erie county of New York, in the Buffalo cases, of the court of Cuyahoga county, Ohio, in the case of the Standard Oil Company against W. C. Schofield & Co. in the "contract in restraint of trade" case, the decision of the supreme court of New York in the case of Samuel Van Sickle against the Acme Oil Company for the suppression of inventions and inventor, the decisions of the interstate commerce commission in the cases of other refiners than Rice attacked by the same methods, the formal declarations of the New York assembly railroad investigating committee of 1879, and of the senate select committee of the forty-ninth congress, and adding to these the many quotations made by him from the testimony of the members of the oil monopoly or men favorable to them respectfully submits that these decisions and findings and friendly testimony can not be properly described as "cunning fiction made up entirely on one sided testimony and dressed for sale."

Further, as to the complaint that the statements regarding the business of the Standard Oil Company

are "distorted," deponent states that he would have been able to add largely to his quotations from the defense of the Standard Oil Company but for the fact, stated by the New York assembly legislative committee of 1879, that they were "unable to ascertain the exact relations of these different organizations, owing to the refusal of several members * * * subpoenaed as witnesses to obey the subpoena, and the refusal of those who did attend to answer questions." The committee refers to the combination as "this mysterious organization, whose business and transactions are of such a character that its members declined giving a history or description of it lest their testimony be used to convict them of a crime."

The deponent further points out that Wealth Against Commonwealth quotes from official sources the fact, which is not now denied by any one, though denied at first, that the men seeking to obtain a monopoly of the oil business organized a company called the South Improvement Company, and that this company in 1872 made secret and unlawful contracts with the principal railroads by which their competitors could move.

And deponent further states that Wealth Against Commonwealth cites other decisions and findings to the effect that, although the charter of this company was almost immediately forfeited by the state of Pennsylvania and the contracts with the railroad canceled, substantially similar relations with varoius railroads were thereafter re-established by the Standard Oil men, as shown in many cases.

To show the part taken by the president of the Standard Oil Company in this South Improvement Company, Wealth Against Commonwealth quotes the testimony of one of the principal associates before congress in 1888 and quotes said president at about the same time in his testimony before the New York senate committee of 1888, when asked under oath if he had not been in the Southern Improvement Company, as saying, "I was not."

Wealth Against Commonwealth reproduces from the official publications of congress and the state of New York the details of the contract made by the South Improvement Company with the railroads of the oil regions as showing that this bound the railroads in substance: First, to increase the oil freight rates, sometimes to double; second, not to charge it the increase; third, to collect the increase from its competitors; fourth, to put the rates of freight up or down as might be necessary to overcome competitors; fifth, to spy out the details of the business of these competitors and make reports to the South Improvement Company of all shipments made by these competitors, with full particulars as to how much was shipped and to whom, and so on.

The purpose of this contract was stated by the vice president of the Erie railroad, a witness friendly to the South Improvement Company and the Standard Oil Company, to be to give it "a complete monopoly."

The Hon. S. C. T. Dodd, now and for many years counsel for the oil monopoly, when still an anti-monopolist, a member of the constitutional convention of Pennsylvania in 1873, said:

"The South Improvement Company's scheme would give that corporation the monopoly of the entire oil business of this state, amounting to $20,000,000 a year."

The causes of the forfeiture of the company's charter and the cancellation of the contracts are declared in Wealth Against Commonwealth to have been publicly stated by Mr. Dodd in the proceedings of the Pennsylvania constitutional convention of 1873 as follows: "Their scheme was contrary to law, but before the legal remedy could have been applied the oil business would have lain prostrate at their feet, had it not been prevented by an uprising of the people, by the threatenings of a mob, if you please, by threatening to destroy property, and by actually commencing to destroy property of the railroad company, and had the companies not cancelled the contract which Scott and Vanderbilt and others had entered into, I venture to say there would not have been one mile of railroad track left in the county of Venango, the people had come to that pitch of desperation."

The identity of the South Improvement Company and the Standard Oil Company is shown by the fact that 10 of the 13 members of the South Improvement Company were active members of the oil trust, among them the president and the majority of its directors. The New York assembly committee of 1879 officially confirmed this, saying, "The controlling spirit of both organizations being the same."

The denial and explaining away of this affair by the president of the Standard Oil Company are fully credited to him in Wealth Against Commonwealth.

Deponent further states that nowhere in Wealth Against Commonwealth does he allege that business was continued under this contract, but does allege that the fact that these men were willing to make and did make such a contract and withdrew only when threatened with popular revolution is a headlight illuminating their whole track and since then.

Deponent further states that Wealth Against Commonwealth cites official records, like the decision in 1885 of the supreme court of Ohio, to show that the Standard Oil men, after the abrogation of this South Improvement Company contract and the nominal abandonment of the scheme, proceeded to make other contracts with various railroads, practically similar in important particulars to the contract of the South Improvement Company, and that he cites the adjudications and testimony in the Rice case and in other cases before the interstate commerce commission which are to the effect that these relations continued even after the passage of the interstate commerce law had made unlawful railroad discriminations criminal.

Deponent further says that his statement in Wealth Against Commonwealth that this South Improvement Company no longer exists in name, only "in reality," and that the decease of the name was no obstacle to the continuance of the scheme is supported in Wealth Against Commonwealth by official findings in others than the Rice cases.

Wealth Against Commonwealth quotes from the exhibits, affidavits and decisions in the case of Standard Oil Company vs. W. C. Schofield et al., Cleveland, 1880, to the following effect: "In 1876, four years after the for feiture of the South Improvement Company charter,

and the cancellation of the contracts, the president of the Standard Oil Company conducted a negotiation with a firm of Cleveland competitors in which they were put under bond to refine only about half their capacity for the ensuing 10 years."

An Ohio court set aside the contract as unlawful and "in restraint of trade." Wealth Against Commonwealth cites, as indicating the source of the power which had enabled this bond to be forced on unwilling competitors, a decision of the supreme court of Ohio in 1885, 13 years after the apparent abandonment of the South Improvement Company scheme. This decision revealed that in 1875, a year before making this contract "in restraint of trade," the Standard Oil Company had secured a contract from the Lake Shore railroad, which, like the South Improvement Company contract, was meant, as the supreme court of Ohio said, "to keep the price" of transportation "down for the favored customers, but up for all of the others, and the inevitable tendency and effect of this contract was to enable the Standard Oil Company to establish and maintain an overshadowing monopoly, to ruin all other operators and drive them out of business."

The purposes of the oil company in this contract with the railroad the court declared to be unlawful, and the court in the same case declared a contract between two railroads which was related to the business of the oil company and in its interest to be "not only contrary to a sound policy, but to the lax demands of the commercial honesty and ordinary methods of business."

Deponent further refers the Industrial Commission to the fact that Wealth Against Commonwealth quotes official findings showing that the monopoly of pipe lines now held by the Standard Oil men and constituting the most valuable part of their property was obtained by them by the help of railroad discriminations closely resembling those they sought to procure from the South Improvement Company.

The report of the New York assembly committee of 1879 is quoted to show that the rates made by the railroads to the pipe lines of the Standard Oil Company were such that the company "could overbid in the producing regions and undersell in the markets of the world."

The relations of the oil monopoly with the railroads in this case were regarded by the committee as in "flagrant violation of every principal of railroad economy and natural justice."

This discrimination was followed by the absorption of the pipe lines belonging to the men who could not get the rates that were "flagrant" by those who could get them and by the creation of the present pipe line monopoly.

The last great act in the completion of this monopoly was the conquest of the Tide Water Pipe Line, also along the lines of the South Improvement Company scheme. The Tide Water was the first trunk pipe line built to the seaboard, one of the most important developments ever made in the oil business, and due not to the oil trust but its competitors, as has been all the improvements except the "Improvement" Company. It was built by the surviving independent oil producers and refiners of Pennsylvania in their desperate struggle to escape the discriminations of the railroads against them in behalf of the monopoly.

The railroads in the interest of the monopoly made war on the Tide Water, reducing rates, as was stated by a witness friendly to the monopoly, to "not enough to pay for the wheel grease," with the ultimate result that the Tide Water Pipe Line passed, in 1883, into the control of the National Transit Company, which is the pipe line branch of the oil monopoly.

Wealth Against Commonwealth quotes the president of the Standard Oil Company under oath in 1888, before the New York senate committee on trusts as swearing that the Tide Water was a "competing company," in opposition to his company, and quotes him in the same investigation, when asked if he had any connection with the National Transit Company, which is the most valuable part of his oil trust's property, as saying, under oath, "I have not." Wealth Against Commonwealth then quotes the attorney and treasurer of the Tide Water as both testifying that a contract to settle their rivalry in business had been made in 1883, and quotes the interstate commerce commission in 1892 as judicially finding the same fact, saying, "About December, 1883, the pipe lines, with the view of getting better rates, adjusted their differences and the competition between them ceased. The pipe line business appears then to have passed into the control of the National Transit Company."

Wealth Against Commonwealth reproduces the official finding of the New York assembly committee of 1879, that, in 1877, the railroads of the east, largely the same that took part in the South Improvement Company, united in a railroad war against the Pennsylvania railroad and "joined hands with the Standard Oil Company and proceeded to enforce by a war of rates, which terminated successfully in October of that year" a sale by the Pennsylvania railroad to the oil monopoly of its entitre outfit, pipe lines, cars and refineries in New York and Pennsylvania. This again was like the South Improvement Company scheme of 1872, in which the railroads had bound themselves to "maintain the business against loss or injury by competition," and to put the rates of freight up or down as might be "necessary to overcome * * * competition." Wealth Against Commonwealth also quotes the testimony shortly after in a Pennsylvania court of the present president of the Pennsylvania railroad, Mr. A. J. Cassatt, always friendly to the oil trust, to the effect that after this forced sale by the Pennsylvania railroad of its oil business and oil outfit, all the remaining competitors of the oil monopoly who were doing business over the lines of the Pennsylvania railroad were notified, according to the South Improvement Company precedent, that the Pennsylvania railroad would thereafter give lower rates to the members of the oil monopoly than to them, though they had been during the preceding year the largest shippers of oil over the road, and that they would not be allowed to put cars of their own on the road, though the Standard Oil Company were allowed to do so.

In referring to Mr. John D. Archbold in these proceedings, Wealth Against Commonwealth confines itself to the records. It quotes him when put on the witness stand, in the proceedings brought by the state

of Pennsylvania against the Pennsylvania railroad in consequence of this discrimination, as stating under oath that he was not allowed a rebate amounting to $0.64½ per barrel, but immediately afterwards compelled to produce his books, admitting "there was a total allowance of $0.64½ a barrel."

Deponent further states that judicial inquiry in Pennsylvania and legislative inquiry in New York are used by him in Wealth Against Commonwealth as showing that the Pennsylvania and other railroads, acting as if in pursuance of the South Improvement Company plan, paid to some of the members of the Standard Oil Company, under the name of the American Transfer Company in 1878, an allowance of 22½ cents a barrel on all the oil these railroads carried from the oil regions. This payment was defended as made for the service of the American Transfer Company in collecting and delivering the oil to the railroads, but Wealth Against Commonwealth quotes the present president, Mr. A. J. Cassatt, as swearing that this allowance was paid to the American Transfer Company on oil which it (the American Transfer Company) never handled. "It is paid on all oil received and transported by us." (Commonwealth of Pennsylvania vs. Pennsylvania Railroad et al., 1879, p. 691.)

Deponent further points out that official, judicial and legislative sources of information are quoted in Wealth Against Commonwealth to the effect that the plans contemplated in the South Improvement Company contract with regard to a monopoly of oil terminal facilities had been substantially carried out since the cancellation of that contract. The South Improvement Company's bargain of 1872 had provided substantially that the railroads should turn over to it such oil terminal facilities as they possessed at the seaboard.

Seven years later, in 1879, the New York assembly commitiee found that the oil combination was in control of the oil terminal facilities of the four great trunk lines at New York, Philadelphia and Baltimore, and the committee stated in their report that "they can use the power here given, and have used it to crush out opposition"; and 20 years later, in 1892, the western traffic manager of the Erie testified before the interstate commerce commission that he would not receive at the Weehawken oil docks of the Erie road a shipment of oil in competition with the oil of the monopoly, and in 1892 the interstate commerce commission found that the combination "have a monopoly of those facilities to the ecxlusion of complainants."

As to the Rice case, which Mr. Archbold emphasizes, Wealth Against Commonwealth quotes the decisions of a Federal court, of the interstate commerce commission, of the supreme courts of New York and Ohio and the testimony of friendly railroad men and of men connected with the Standard Oil Company to the effect that the important features of the South Improvement Company scheme were substantially reproduced in the treatment given Rice by many railroads.

Freight rates were doubled to Rice and more, but not only were not increased to the monopoly, but actually lowered to it, and freight rates collected from Rice were paid over to it. The railroads in 1879 and later, which in 1872, in the language of the South Improvement Company contract, undertook to "maintain the business against loss of injury by competition," and to make the freight rate such as might be "necessary to overcome such competition," again refused Rice, after the passage of the interstate commerce act, as the Pennsylvania railroad did to the other independents mentioned above, the right to put on his own cars, and in repeated cases, refused him information even as to what would be the freight charged him if he undertook to ship anything.

Wealth Against Commonwealth quotes from the testimony of one of the men of the oil monopoly given before the interstate commeree commission, to the effect that the feature of the South Improvement Company arrangement, by which the business done by its competitors was to be spied out for the oil monopoly, was reproduced in the treatment given Rice.

In the first South Improvement Company only half a dozen of the eastern trunk lines took part, but in this later application of its methods to Rice nearly all the railroads in the Mississippi valley and on the Pacific coast took part. A deliberate and successful attempt was made to prevent Rice from doing business, except by accident and at a loss, in any town, county or state in which these roads could, by their power of manipulating rates, determine the question of business existence.

Wealth Against Commonwealth quotes from the records to show that the things done for this purpose by the railroads and inuring to the interest of the oil monopoly were so relentless and destructive and so outside the law that the judges and other public representatives in thir decisions and reports were startled out of their formal phraseology usual in such deliverances into expressions of unaffected indignation.

Referring to one of the arrangements by which the railroads doubled Rice's freights, and out of every 35 cents he paid them handed over 25 cents to the Standard Oil Company—in reproduction of the South Improvement Company and the American Transfer Company schemes—Wealth Against Commonwealth quotes Judge Baxter, of the Federal circuit court of Ohio, as calling it "abhorrent," "dangerous," "gross," "illegal," "an inexcusable abuse by a public trust," "unparalleled wrong," "discrimination so wanton and oppressive it could hardly have been accepted by an honest man, and a judge who would tolerate such a wrong or retain a receiver capable of perpetrating it ought to be impeached and degraded from his position."

A senate select committee on interstate commerce of the forty-ninth congress is quoted as, after investigating the matter, characterizing the transaction as follows: "No comment is needed upon this most impudent and outrageous proposition"—by the oil company to the railroad.

Wealth Against Commonwealth shows that the Ohio supreme court in deciding a case brought by the State of Ohio against certain railroads to forfeit their charters for their treatment of Rice, decided that these railroads had charged "discriminating rates," "strikingly excessive," which "tended to foster a monopoly," "actually excluded these competitors," "giving to the favored shippers absolute control."

It shows also that the supreme court of New York in deciding another case in which Rice was a litigant with the oil trust, for his rights as a stockholder, said that the oil trust was "for the purpose of forming a combination whose object was to restrict production, control prices and suppress competition," and the "trust agreement was therefore opposed to public policy and void."

Wealth Against Commonwealth calls public attention to the fact that a large part of the time and attention of the interstate commerce commission was taken up for several years in hearing the complaints of Rice to it for redress, and that in a large proportion of the cases brought by him before the commission, it found his complaints justified, and ordered the roads to give him relief. The discrimination made by the railroads against Rice for the benefit of the Oil monopoly were so great that even the self-contained interstate commerce commission had to call them "vast discrepancies."

Wealth Against Commonwealth quotes the commission as stating in 1893 that these discriminations were made "on no principle. * * * *Neither greater risks, greater expense, competition by water transportation, nor any fact or circumstance brought forward in defense, nor all combined, can account for these differences."

Again, speaking of the refusal of rates to Rice, the commission said: "Complainant did not succeed in obtaining rates. The denial of his right was plain and stands unexcused. * * * What reason there may have been for it"—the refusal of rates—"we do not know, but find they were not just or legal reasons."

The refusal to give Rice these rates was an "illegal refusal," the commission decided; "the obligation to give the rates * * * was plain and unquestionable."

The treatment of Rice by the railroads in another particular the commission adjudicated to have been "specially oppressive," and it "would have put success in the traffic out of the question."

Rice was misled and misinformed by the railroad officials, and Wealth Against Commonwealth quotes the interstate commerce commission as noting this fact and pointing out the "remarkable thing" that so many of these "defendants," the railroads, "should make the same mistake, a mistake, too, that it was antecedently so improbable any of them would make. The Louisville and Nashville, the Cincinnati, New Orleans and Texas Pacific, the Newport News and Mississippi Valley and the Illinois Central companies are all found giving out the same erroneous information, and no one of them can tell how or why it happened to be done, much less how so many could contemporaneously, in dealing with the same subject, fall into so strange an error. It is to be noted, too, that it is not a subordinate agent or servant who makes the mistake in any instance, but it is the man at the head of the traffic department, and whose knowledge on the subject any inquirer would have a right to assume must be accurate. In no case is the error excused."

Wealth Against Commonwealth quotes some of the expressions used by the interstate commerce commission with regard to the complaints before it of discriminations by the railroads, as follows:

"Great differences in rates," "unjust discrimination," "international disregard of rights," "unexcused," "a vast discrepancy," "enormous," "illegal," "excessive," "extraordinary," "forbidden by the act to regulate commerce," "so obvious and palpable a discrimination that no discussion of it is necessary," "wholly indefensible," "patent and provoking discriminations for which no rational excuse is suggested," "obnoxious," "disparity * * *absurd and inexcusable," "gross disproportions and inequalities," "long practiced," "the most unjust and injurious discrimination * * *and this discrimination inured mostly to the benefit of one powerful combination."

The deponent further states that in Wealth Against Commonwealth he has taken the verdicts, decisions and findings of the courts and legislatures as the authoritative version of the facts, and that it has not been shown that he has either inaccurately quoted or omitted any important fact on the record, nor that he in any case has failed to give the reader information as to the nature of the defense, nor have his statements in any case gone beyond the record.

Deponent further says that his statement in Wealth Against Commonwealth that Mr. Archbold when asked what was his part in the business of the Standard Oil Company, replied, "I am a clamorer for dividends; that is the only function I have," is a quotation from the testimony of Mr. Archbold before the New York assembly commission of 1879 investigating the railroads and their relations to the oil monopoly and other favored shippers.

Wealth Against Commonwealth quotes from the reports, decisions and testimony of the interstate commerce commission to show that the principal matters litigated before the commission have been discriminations made by the railroads to the profit of the oil monopoly; that the cases referred to cover the oil business on practically every road of any importance in the United States—in New England, the middle states, the west, the south, the Pacific coast; on the great east and west trunk roads—the Pennsylvania, the Erie, the Baltimore and Ohio, the New York Central, and all their allied lines; on the transcontinental lines—the Union Pacific, the Central Pacific, the Southern Pacific; on the steamship and railroad association controling the south and southwest; and that from ocean to ocean, and from the Gulf of St. Lawrence to the Gulf of Mexico, wherever the American citizen seeks an opening in this industry, he finds it a "privilege" of a few and shut against the common people.

The witnesses on whose testimony are founded the decisions of the courts, legislative committees and other findings which make the substance of Wealth Against Commonwealth have come forward all through the period between 1872 and 1894, the date of Wealth Against Commonwealth, and from every point of importance in the industry—New York, Pittsburg, Cleveland, Oil City, San Francisco, Titusville, Philadelphia, Marietta, New Orleans, Buffalo, Boston, Cincinnati, Louisville, Memphis; they have come from every province of the industry—the refiners, the oil fields, the pipe lines, the railroads, the wholesale and retail mar-

kets; bound together by no common tie or organization or partnership, they have, each and all exactly the same story to tell. Wealth Against Commonwealth gives as the substance of their complaint that one selected knot of men, members of one organization, were given unlawfully the control of the railroad highways to the exclusion and ruin of the people, and quotes to sustain it the evidence taken by many official investigations and the decisions of substantially every court to which the facts have been submitted.

Deponent further points out that the testimony taken by the interstate commerce commission in Boston March 12, 1898, seems to show that one of the most important railroads in New England, the Boston and Albany, 26 years after the South Improvement Company scheme dies "in name," was "underbilling" cars of the oil trust to such an extent that in some cases half of such shipments within Massachusetts went free.

Lastly, the evidence taken in the investigation in the early part of 1900 by the Canadian parliamentary committee, if correctly reported, seems to indicate that the same South Improvement Company system, substantially, has been extended by the Canadian railroads to the oil trust, and that these railroads have been putting the "price"—of transportation—"down for the favored customers and up for the others," just as the supreme court of Ohio found the railroads of that state doing for the same organization in 1885:

The deponent further says in answer to the insinuation as to his share in the alleged blackmailing operations of Rice, that he feels it to be unnecessary to notice anything of which the insinuator himself is compelled to state, "I am unable to say." And he challenges the production of an iota of fact justifying even the utterance of the insinuation.

The deponent further points out that the method by which the members of the oil monopoly meet the decisions, verdicts and findings of which Wealth Against Commonwealth is based is to treat all those utterances of the constituted authorities, judicial and legislative, as nullities, and insist that the public shall receive from themselves, now and out of court, years after the events in question, without any of the protective procedure of trial and investigation, entirely new versions of the matters concerned, altogether in conflict with the findings reached by these tribunals at great expense of the people's time and money. Though in every case they had a full and fair hearing, they refuse to accept like ordinary citizens the findings of the courts and legislatures and deny the right of the people to accept as authentic any official records which contain truths disagreeable to themselves.

HENRY DEMAREST LLOYD.

State of Rhode Island, County of Newport:

Subscribed and sworn to before me this 4th day of August, 1900. F. R. BROWNELL,

[SEAL.] *Notary Public for Rhode Island.*

AFFIDAVIT OF CHARLES B. MATHEWS.

Producer and Refiner of Petroleum, Buffalo, N. Y.

State of New York,

County of Erie, City of Buffalo, ss:

Charles B. Mathews being duly sworn, says that he is 55 years of age and a resident of the city of Buffalo, N. Y., and that he has been for nearly 30 years engaged in the production, refining and dealing in crude petroleum and its products; and deponent further saith:

In reading the testimony of J. D. Archbold, on page 554 of your committee's printed record of testimony relative to the Standard Oil combination, I find such errors and misstatements regarding myself and associates, "lay and professional" that I beg leave to submit the "simple facts" in their true light. In the year 1880 J. S. Wilson, A. A. Miller and myself were employed by the Vacuum Oil Company. None of us being engaged for any specified time, we were at liberty to engage in any occupation we saw fit. I had much to do in the management of their salt property and their few oil leases. These properties were sold soon after the Standard Oil Company bought three-fourths of the stock of the Vacuum Oil Company and began to conduct its business. J. D. Archbold, H. H. Rogers and A. M. McGregor, being its ruling force, directed its business from the Standard Oil offices in New York. In the testimony of F. N. Beach, on page 900 of the report of the manufacturers' congressional committee, 1888, we find that the district attorney, in the prosecution of the cause of the people, subpoenaed certain books of record, and Mr. Beach, secretary of the Vacuum Oil Company, said: "I was also subpoenaed to produce here the record books containing the proceedings of the board of directors of the company, and I now produce the same. I know John D. Archbold, and I know his handwriting." The district attorney then calls the attention of the witnesses to the meeting of the board of directors of the Vacuum Oil Company held January 18, 1881.

Witness says the meeting are in the handwriting of John D. Archbold.

The district attorney then read from the meeting of January 18, 1881:

"Meeting called to order by Charles M. Everest, vice president. Present: Henry H. Rogers, Charles M. Everest and John D. Archbold.

"On motion John D. Archbold was appointed secretary.

"Waiver of notice by A. M. McGregor and H. B. Everest presented to the secretary.

"H. H. Rogers moved that a dividend of 40 per cent, payable as of January 1, and 10 per cent, payable as of January 1, to be paid at once from the earnings of the company.

"Carried.

"On motion, adjourned.

"(Signed) JOHN D. ARCHBOLD,
"Secretary Pro Tem."

The Everests, father and son, who had built up the business of the Vacuum Oil Company as an independent anti-monopoly company, now held the offices of president and vice president simply as figureheads to maintain, for trade purposes, the pretense that they were not a Standard company. Published statements in the Rochester papers appeared denying that they had sold to the Standard Oil Company, and seemed to satisfy their consciences by saying to those who knew the truth that it was the Acme Oil Company they had made the deal with, whereas all the Acme Oil Company stock belonged to the Standard. The Standard management of the Vacuum Oil Company was distasteful to those accustomed to the service of the independent original Vacuum Oil Company, and they expected things might occur, which have since taken place—that their principal refining and manufacturing would be transferred from the Vacuum to other Standard plants and their selling agents dismissed. The Standard people, under various names, corporations and contracts, controlled the manufacture and sale of nearly all the petroleum lubricating oils of the country. Their monopoly was so complete that Cylinder stocks then sold for 20 to 25 cents per gallon, when crude oil was 80 cents per barrel, that now sell under competition for eight cents per gallon. With crude oil worth $1.25 per barrel, the best refined oil was sold at Buffalo and other eastern cities at 14 cents per gallon, that now sells at eight cents per gallon. We also knew very well that to use the Vacuum and other processes we desired to employ was no infringement on any valid patents, and subsequent litigation in the Federal courts fully proved the groundless nature of their patent claims, and the evident object of the Standard people in bringing suits was for the purpose of involving us in expensive and harassing litigation, eventually resulting in court decrees in our favor. The claim that we used some of their tools in preparing our machinery is not a serious one. If any one in my employ used their chalk line or pocket rule or other tool, I was not aware of it, and trust the Standard trust will outlive its grief and loss on that score. From 1880 to 1885 the Standard people brought many suits against the independent manufacturers of oils, petroleum and greases. These suits were brought in the name of the Cheeseborough Manufacturing Company, or Vacuum Oil Company, or some company recently acquired by the Standard, and I believe none of these suits were ever successful, except in compelling the defendants to incur large expense in gathering evidence to defeat plaintiff's claims. The Buffalo Lubricating Oil Company was the name of my company, and the stock was soon subscribed for by those who had faith in the business of refining and selling oil. No business undertaking could be more legitimate, and the margin of profit between the cost of the crude and the selling price of the manufactured product was reason enough to enlist necessary capital. Mr. Archbold, in his statement before your commission, denies that the Standard Oil companies enjoyed discriminations and freight rebates not given to their competitors. If the Vacuum Oil Company, under the management of Messrs. Archbold, Rogers and McGregor, could pay the dividend of 40 per cent in a few months in 1881, as shown by the above record of their directors' meeting, and the Standard combine stock now sells for $800 per share, I must insist my company had a perfect right to expect good profits from manufacturing, transporting and selling oil, or the Standard profits were and are illegitimate and fraudulent. We fully established our rights in the courts to engage in the business as we did and when we did. Where should we begin? Buffalo was decided upon as the best location. Here the Atlas Oil Company was constructing a large oil refinery and endeavoring to lay pipe line from the Bradford oil field to Buffalo. The Atlas people assured us of their ability and determination to pipe oil to Buffalo and refine it there without the consent of the Standard Oil trust. The Atlas Oil Company promised me that they would give my company a five-year contract to furnish crude oil at our works, charging us 10 cents per barrel for piping it to us, and they would give us a contract as soon as the line was completed, and the "Green Line," running tank cars on Buffalo, New York and Philadelphia railroad, offered to bring us oil at the same price. In a few months the Standard trust got control of the Atlas pipe line and refinery and advanced at once with the railroads carrying charges on oil from 10 to 25 cents per barrel, and subsequently to 35 cents per barrel. The railroads also advanced all rates on oil going out of Buffalo, while rates on grain, coal, lumber and other commodities were generally reduced. The first still of oil run at our works was run under such extraordinary heat and pressure, with safety valve fastened down, that the gases were blown off at explosive pressure and the oil ruined and considerable property was destroyed, and we narrowly escaped the destruction of the entire works, with many fatalities. Our superintendent fled under the most suspicious circumstances and was secreted by and placed on the payroll of the Vacuum Oil Company, they maintaining him mostly in idleness; secretly sent him to California, where he remained nearly a year. After abundance of evidence of the power and cruelty of the Standard-Vacuum conspiracy came to hand my company brought suit against the Vacuum Oil Company and its officers, asking damages in $100,000. This suit was brought in 1883. The defendants exhausted all their resources for delays, and finally came to trial March, 1885. The rulings of the trial justice were so narrow and so evidently against the plaintiff that the judge preferred to grant a new trial to having the case go up on appeal, and a new trial was granted nearly a year after our verdict of $20,000 was given by the jury. Thereupon we brought a new conspiracy action, with broader allegations, and asking damages in $250,000.

Our various suits with the Standard parties had taught us the great power of the Standard attorneys in securing long delays in forcing a case in which they were interested to trial on its merits, and as the five-year limitation had almost run, the district attorney felt it his duty to indict them in the criminal court. About his time, however, my company brought an action against the Atlas Oil Company, alleging damages and fraud to the amount of $20,000. We alleged

that this company, having passed into the hands of the Standard, supplied us with inferior crude oil mixed with distillate and slops from the Atlas works, and that the same was sold us as pure crude oil. At a term of Erie county court of sessions in February, 1886, an indictment was found by the grand jury, charging Hiram B. Everest, Charles M. Everest, John D. Archbold, Henry M. Rogers and Ambrose McGregor of the crime of conspiracy and committed as follows: Copy of this indictment is found in the manufacturers' congressional committee's report of 1888, beginning on page 801. The defendants are accused of conspiracy to destroy the business of my company by corrupting its servants, by bringing vexatious suits at law for the purpose of harassing the company, by blowing up our works, and destroying a quantity of oil. The Standard suspects fought off the day of their criminal trial with the same success as they had done in the civil courts. Meanwhile their attorneys and detectives were busy with plans to hire the state's most material witnesses to go to a foreign country. Burdened with the expenses of the civil action and weary with delays, I made a final appeal to the district attorney urging immediate trial of the people's cause, and was told no judge could be got to hear the criminal case in the spring of 1887. I told him I should appeal to the governor to assign a judge for that purpose if there was no judge in our district willing to take it who was not disqualified. It was soon arranged for Judge Daniels to try the action. But Judge Daniels had tried and sentenced Jarvis Lord, of the famous canal ring, and so the Standard defendants were taken unawares and were not to be tried just then or by Judge Daniels. Affidavits of physical disability of Mr. Archbold and others put the trail off to a time Justice Daniels must hold court in New York, and it was then ascertained that Judge Haight would try the suspects. The district attorney was not pleased with the substitution of Judge Haight for Judge Daniels. I urged the district attorney to go on with the trial, as we could at least prove the allegations of the indictment, and make a record of the testimony, whatever judge tried the case, and the state's witnesses would be relieved from the pressure of the Standard's spies and detectives. It was shown at the criminal conspiracy trial that one Lane Borell, an employe of my company, was in the secret service of the Standard interests and that they paid him a higher daily wage for making daily reports of our sales and customers and business than we paid him for work at the refinery. These reports were mailed from Borell direct to S. C. T. Dodd, Standard attorney. Borell received his pay indirectly through Mr. Dodd, and it was shown by the books of account kept by the Vacuum Oil Company that Miller received some $4,000 for a year of running and hiding from my company while he was under contract from us for the same period at $100 per month for service as superintendent at our works. The district attorney also put in evidence the testimony of J. D. Archbold, given in the civil action tried in 1885, as follows:

"Q. During the year 1881 and the year 1882 were you connected in any way with the Standard Oil Company; and if so, what? A. I was.

"Q. In what capacity or way? A. I was one of the executive board of the Standard Oil Company.

"Q. Mr. Archbold, you made the contract, did you not, with reference to the transfer of the 75 shares of the Vacuum Oil Company's stock by the Messrs. Everest? A. I bought the 75 shares; yes, sir.

"Q. Was that transaction a verbal transaction or a transaction reduced to writing? A. There was a written contract following the transaction as agreed.

"Q. Can you tell to whom the contract was delivered when it was completed? A. It was delivered to the counsel of the purchasers whom I represented.

"Q. May I inquire who the counsel of the purchasers to whom it was delivered were? A. It was George F. Chester; my impression is that the contract is on file at the office of the Standard Oil Company in Cleveland; I am not sure about that.

"Q. Let me inquire who George F. Chester was and where he lives? A. He was at that time the counsel for the Standard Oil Company, and the Everest interests that were affiliated with it.

"Q. How long is it since you have seen the contract? A. I don't think I have seen it since the time of its execution.

"Q. You never had it in your possession since? A. No, sir.

"Q. Where would such papers be kept in the usual course of your business? A. We had a record of the contract in our office in New York, it was in a large contract book which we kept for the purpose of recording contracts, but the paper itself I am not sure about; it may have been kept in New York, and it may have gone to Cleveland; I am not sure about that.

"Q. Mr. Archbold, whom did you represent in that transaction? A. I represented the shareholders of the Standard Oil Company.

"Q. After this purchase was made, did you continue to represent the purchasers in the management of the affairs of the Vacuum Oil Company? A. I did.

"Q. By virtue of power delegated to you or by virtue of being a member of the board of directors or trustees of the Vacuum? A. By virtue of power delegated to me .

"Q. By the purchasers? A. By the purchasers."

As further showing what control the Vacuum Company was under, I asked C. M. Everst for an increase of salary if I remained at Rochester, and he referred me to Mr. Archbold as the one to determine that, and as things grew more unsatisfactory, I gave them notice that I should quit in a short time. The state's attorney had evidently made out a convincing case against the defendants on the criminal trial. When he rested the case Judge Haight asked the jury to stand up, and he instructed them to acquit Archbold, Rogers and McGregor and continue the trial concerning H. B. and C. M. Everest. Some of the jurymen afterwards told me that this act of the judge greatly embarrassed their subsequent action, as the very ones who had the leading motive in the conspiracy to destroy competition in the oil business were taken out of the case, while their agents and tools were left for the jury to deliberate about. The judge had in his hands the sworn answer of J. D. Archbold, H. H. Rogers and McGregor in the $250,000 tort action in

which they admitted that they had advised their co-defendants, Hiram B. Everest and Charles Everest, also directors of the Vacuum Oil Company, to re-employ Miller at increased wages, and advised bringing actions on alleged infringement of their patents. This sworn answer in the civil action was withheld from the jury in the criminal trial by Judge Haight as not being permissible to use the sworn answer in civil action to convict the one making it of crime, and of course the Standard officials had so often refused to explain their doings before courts and committees lest their evidence be used to convict them of crime, that they were lucky in escaping at the very moment when their conviction seemed certain. And now comes Mr. Archbold to your committee with the affidavits of six of the panel of jurymen that Judge Haight delivered him from. These affidavits, you will notice, were taken one year after the trial. Any one at all acquainted with the situation will believe it possible that even six of the jurymen, or in fact, any of them, would have signed any such affidavits when the trial closed and the jury was together and the facts of the trial fresh in remembrance. But taking them one by one, under the pressure and encouragement of adroit lawyers, six of them yielded. When these affidavits were first presented District Attorney Quimby offered to prove that money was offered to procure similar affidavits from other jurymen of the panel. Of course the Standard defendants got all the affidavits they possibly could of that kind. The affidavits read as follows:

State of New York, County of Erie, ss:

"Nicholas Demerly, of the town of Boston, John J. Kinney, Bernard Schlebus, R. B. Vusan, Geo. W. Havens, John Uebluehcr, being duly sworn, each for himself, deposes and says: That he was one of the jury that served on the trial of H. B. Everest and C. M. Everest for conspiracy in the Erie county oyer and terminer in May, 1887; that the said jury rendered a general verdict of guilty against both of said defendants. And deponent further says that, as he verily believes, it was not the intention of said jury, in rendering said general verdict, to pronounce the defendants guilty of an attempt or conspiracy to blow up or burn the works of the Buffalo Lubricating Oil Company, limited, but the conviction was, in the mind of deponent, based upon the enticement of the witness, Miller, from the employ of said oil company, and he believes that the other members of the jury convicted the prisoners on the same ground. And deponent further says that he believes the ends of the justice will be met in this case by the imposition of a fine upon the defendants, and he therefore begs to recommend to the court that the sentence of said defendants be that they pay a fine only and that they be not sentenced to imprisonment."

This affidavit was verified by the men whose names appear in the above copy of the affidavit. The maker of this affidavit avers that he did not vote for a conviction of the Everests for blowing up the works of the Buffalo Lubricating Company, but for the enticement of the witness, Miller, from the employ of said company.

Now, in the sworn answer of the defendants, acquitted by order of Judge Haight, they admit that they advised the hiring of Miller from my company.

It must be evident to any one reading the official record of the conspiracy trial as given in the report of the manufacturers' congressional committee's report, 1888, that the charges of the indictment were fully proven, and that the three big Standard officials would have been convicted with the Everests if they could have gone to the jury at the close of the trial in 1887. The Everests went into this trial with the advantage of good reputations as honorable business men. Standard officials have been repeatedly indicted for violations of law, and their bad reputation is so well known that Mr. Archbold and other Standard officials and attorneys choose to refer to the "ignorance and prejudice" of the people against big corporations as the cause of the conviction of some of the conspirators at the Buffalo trial. I do not wish to review the Buffalo trial, but no one knows better than Mr. Archbold and his associates the truth of the old saw that—

"No man e'er felt the halter draw,
"With good opinions of the law."

The Standard defendants had been unanimously decided against by two grand juries and two petit juries in Buffalo, and they found abundant evidence of the Standard conspiracy. If untrue or misleading testimony was given by any one at the conspiracy trial, why did all the defendants choose to remain silent and give no word of testimony in their own behalf, and then go on forever abusing witnesses and attorneys for telling what the conspirators dare not dispute from the witness stand? The Standard conspiracy did not end with the conviction of the Everests and the escape of their associates in crime from immediate and full punishment under the law. My company was harassed in shipping its oil to and from the refinery until we felt obliged to associate with others in the oil field in building tank cars, tanks, etc. We found discriminations in freights under the interstate commerce law were as harmful, if more secret, than before, and finally with the failure of the Excelsior of Cleveland and the Keystone refinery of Oil City, we were so involved that the Lubricating Oil Company was thrown into a receiver's hands. My company had trusted for the benefit of creditors and stockholders, the various causes of action against the Standard conspirators. The judgment creditor obtaining the first judgment against my company was controlled by the Standard people and got a receiver appointed that acted in the Standard interest. The Standard trust then made an offer of $85,000 to the receiver for our refinery in Buffalo and the cancellation of all our suits against the Standard. The hearing of this proposition of the Standard's was brought before Judge Haight by Receiver Norton. Although all the officers of my company urged him not to take it before Judge Haight, to him it went; and was heard by Judge Haight in February, 1888. At the hearing on this motion all the stockholders of my company and the creditors asked to

have the Standard's proposition refused. But Judge Haight ordered the receiver to accept their proposition to that the stockholders and creditors were denied a trial by jury of their causes in action on a demand by the Standard defendants that we should accept their proposition. Judge Haight said at this hearing that the Standard defendants could not be twice punished for the same offense. Hence consequential and punitive damages might be small if they were punished in criminal court, so he ordered the suit settled on the Standard's terms and then when he came to sentence them the following May he fined them $250 each. So that when he had let three of the five defendants out at the criminal trial and settled the civil actions on the offer of the Standard, he then proceeded to fine the millionaire defendants the trifling sum of $250 without imprisonment, lest they be twice punished for the same conspiracy to blow up the works of the competitive refinery. The Standard people had large interests in Buffalo in the way of natural gas, illuminating gas, electric lighting plants, etc., and had a large part of the public press and many attorneys retained, and their retained newspapers and attorneys were worked during and after the criminal trial to express a public opinion favorable to the Standard. But the Buffalo Morning Express was the sturdy defender of the cause of the people and the good name of the intrepid public prosecutor.

Mr. Archbold well knows that Standard officials have been repeatedly sheltered by the governors of this and other states when they were under indictment for violations of law, two governors of the state of New York having refused to extradite them on requisitions of the governors of other states, and now Mr. Archbold complains before your committee. The Buffalo defendants were convicted as charged in the indictment of the conspiracy to blow up the works of a competing refinery. The charges in this case were fully proven, as the charges of freight discriminations ruining the business of George Rice were proven. Hence, Mr. Lloyd in his book, Wealth Against Commonwealth takes the court records for facts in history instead of the brassy denials of the guilty parties.

Large and frequent claims have been made by Standard solicitors and stockholders about their great skill and economies in refining and transporting oil. The independents laid the first pipe lines for transporting oil for short as well as long distances. The Tide Water Pipe line, the first long distance line, was harassed without ceasing by the Standard until compelled to surrender its independence. Prominent Standard officials declared 10 years ago that it was not practical to pump refined oil long distances as the oil would be discolered, and the Standard fought in every conceivable way the laying of the United States pipe line, which the independent people were laying for that purpose (as the records of your commission fully show).

On page 306 of the report of the congressional committee's report on manufactures, 1888, H. M. Flagler, of the Standrad, says "that refined oil does not come from Lima oil at all. The Lima oil can not be refined successfully." On page 77 of the same report I. E. Dean (independent) says they are now able to refine Ohio oil perfectly, so that the smell is taken out entirely. At the time Messrs. Flagler and Dean gave their testimony in 1888, the Standard was rapidly acquiring oil producing territory in Ohio and Indiana, and either did not know that this class of oil had been successfully refined in Canada for 25 years, and now in the United States, or they were systematically engaged in an effort to beat down the price of Ohio oil to obtain control of the production. From my experience as an oil producer and refiner for about 30 years I have found the independents more progressive and scientific and practical in the art of refining oils than the Standard people have been, and the small per cent of refining of oil now done by them is due almost entirely to freight discriminations and rebates in favor of the Standard combine. The remedy for this evil, that grows with the growth of railroad consolidations and lake and ocean transportation companies, I believe must come through the public ownership of railroads, so that they can be used by all people on equal and just terms, and that the people can not be protected in the enjoyment of industrial liberty so long as the roads remain in private hands.

CHARLES B. MATHEWS.

Subscribed and sworn to before me this 16th day of April, 1901. E. N. HEATH,

Commissioner of Deeds in and for the City of Buffalo, N. Y.

AFFIDAVIT OF M. L. LOCKWOOD.

Producer of Petroleum, Zelienople, Pa.

Hon. Thomas W. Phillips,

Vice Chairman, Industrial Commission.

Honorable Sir: I have been reminded by a letter from a gentleman of national reputation that J. D. Archbold had made a personal attack on me in his testimony before your honorable body, delivered by him September 8, 1899, and that it was my duty, in the interests of truth, not to allow your permanent report to be printed without first answering, as such final report would become historic, and be placed upon the shelves of the different libraries and institutions of learning throughout the land.

We who have kept watch of Archbold before investigating committees for nearly a quarter of a century have learned to pay very little attention to what he says. But this letter from a gentleman of national repute reminds me that the public is not now, and that future generations will not be so well posted. And I therefore ask that this sworn answer be ingrafted into the testimony of your report, as I understand that you have adopted the policy of allowing witnesses who have had their testimony attacked to answer by sworn statement. And I have faith that you will extend to me the same courtesy.

I will not burden your pages by answering unim-

portant attacks, for you will note that Mr. Archbold denies everything and anything, not only of my testimony but the testimony of other witnesses not satisfactory to the Standard Oil Company's interests. So I will commence at once at page 559 of his testimony in your preliminary report.

He says: "Mr. Lockwood makes an absurd statement, intended to convey the impression that at the same time refined oil is sold to Germany at two cents a gallon the people of Texas and Arkansas are forced to pay 25 cents. There is, of course, not a word of truth in any such statement, nor does he pretend to furnish, nor can he offer, any evidence in support of it. It is the sort of a statement that a silly demagogue would make in order to create sentiment on this question."

My testimony on this point was this, and will be found on page 394 of your preliminary report:

"I take no stock in the idea that inordinately great capital produces cheaply; where monopoly begins, there improvement ends; it is competition that drives men to economy, improvement and invention; it is monopoly that demands great profit. While competition was putting refined oil into tank steamers for the competitive markets of Germany at two cents a gallon, monopoly, backed by railway favoritism, was forcing the people of Texas and Arkansas to pay 25 cents a gallon for the oil that they burned in their lamps."

Mr. Archbold says, "There is, of course, not a word of truth in any such statement."

I again assert its truth, and here present the sworn evidence and statement from the export books of the independent refiners of America to prove it.

On page 8, independent refiners export books, date of March 9, 1894, the refined oil sold at this date for export was 800,000 gallons. This oil, after commission and other expenses off, netted the independent refiners 2.7 cents per gallon. This oil was shipped to the competitive markets of Germany.

On page 11, March 29, 1894, oil sold this day for export was 3,0000,000 gallons. This oil, after commission and other expenses off, netted the refiners 2.1 cents per gallon. This oil was shipped to the competitive markets of Germany.

Page 12, April 18, 1894, refined oil sold this date for export was 1,500,000 gallons. This oil, after the commission and other expenses off, netted the independent refiners 2.1 cents per gallon. This oil was shipped to the competitive markets of Germany.

On page 13, April 18, 1894, refined oil sold this date for export was 1,250,000 gallons. This oil after the commission and other expenses off, netted the independent refiners 0.210 cents per gallons. This oil was sold to the competitive markets of Germany.

On page 18, June 9, 1894, refined oil sold this date for export was 1,500,000 gallons. This oil, after the commission and other expenses off, netted the independent refiners 2.17825 cents per gallon. This oil was shipped to the competitive markets of Germany.

On page 22, July 20, 1894, refined oil sold this date for export was 1,500,000 gallons. This oil, after commission and other expenses off, netted the independent refiners 2.35 cents per gallon. This oil was shipped to the competitive markets of Germany.

On page 25, September 20, 1894, refined oil sold this date for export was 1,500,000 gallons. This oil, after commission and other expenses off, netted the independent refiners 0.275 cents per gallon. This oil was shipped to the competitive markets of Germany.

On page 26, October 17, 1894, refined oil sold this date for export was 1,500,000 gallons. This oil, after commission and other expenses off, netted the independent refiners 2.275 cents per gallon. This oil was shipped to the competitive markets of Germany.

The commission will note that, in spite of Mr. Archbold's denial, my testimony is more than made good by this statement of the books of the independent refiners of America. And if the commission desires any further sworn evidence on this point, I am ready to produce it.

Even at this late date, the people of Texas are paying $1 for a five-gallon can of oil. And for fear that Mr. Archbold will deny this, I will present the commission with the sworn testimony of the citizens of Texas to prove this statement.

Here see the affidavits:

Know all men by these presents, that the undersigned, as a citizen of the state of Texas, United States of America, and a consumer of petroleum oil, has been obliged within the last year to pay $1 for a five-gallon can of oil, and that is the usual price here for that amount of oil at this time.

Witness my hand and seal this 23d day of April, 1901. J. P. BUCKENDORFER.

Know all men by these presents, that personally brought before me, D. W. Solliday, a notary public in and for Orange county, of the state of Texas, J. P. Buckendorfer, who being duly sworn, deposes and says that the statement set forth in the above paper is true, so help him God at the great day.

[SEAL.] D. W. SOLLIDAY,
Notary Public in and for Orange County, Tex.

Know all men by these presents that the undersigned, as a citizen of the state of Texas, United States of America, and a consumer of petroleum oil, has been obliged within the last year to pay $1 for a five-gallon can of oil, and that is the usual price here for that amount of oil at this time.

Witness my hand and seal this 23d day of April, 1901. M. STEPHENSON,

Know all men by these presents, that personally brought before me, D. W. Solliday, a notary public in and for Orange county, of the state of Texas, M. Stephenson, who being duly sworn, deposes and says that the statement set forth in the above paper is true, so help him God at the great day.

D. W. SOLLIDAY,
Notary Public in and for Orange County, Tex.

And now for the purpose of showing the commission what the people of other states have been paying for their oil where monopoly controls, I desire to submit the following sworn statement:

Know all men by these presents, that the undersigned, now a citizen of Butler county, Pa., but from 1885 to 1890 was a citizen of Orange county, Fla., that while there I was a consumer of petroleum oil and paid while there not less than 25 cents a gallon for the oil that I burned in my lamps, and that was the usual retail price for oil at that time in that state.

Witness my hand and seal this 9th day of May, 1901.

STEPHEN LOCKWOOD,

Know all men by these presents, that personally before me, Paul W. Miller, a commissioner of deeds for the state of New Jersey, in Pennsylvania, appeared Stephen Lockwood, who being duly sworn, deposes and says that the statement set forth in the above paper is true, so help him God at the great day.

[SEAL.] PAUL W. MILLER

A Commissioner of Deeds for the State of New Jersey, in Pennsylvania.

And yet in spite of all these statements and sworn affidavits, and regardless of the penalty for perjury, and with customary audacity, Archbold brushes aside my testimony by saying, "There is, of course, not a word of truth in any such statement."

On page 560 of your preliminary report Archbold presents a portion of my testimony, as follows:

"Q. (By Mr. Kennedy.) Mr. Lockwood, can you state approximately what per cent of the refined oil of this country is turned out by the independent companies? A. We calculate that they are handling about four per cent.

"Q. Only four per cent? A. Only four per cent; you know this is an immense business.

"Q. (By Mr. Phillips.) That is, taking the Ohio oil? A. Taking the Ohio oil and the Pennsylvania oil and all these different grades of oil."

At the time I was called to testify before your honorable body the rumors were already afloat that the Cudahys and Manhattan oil companies, operating principally in Ohio and Indiana oils, with their pipe lines and refineries, were being absorbed by the Standard Oil Company, which rumors afterwards proved to be true, and the absorption was done through the route of an English syndicate, and it was from this standpoint that my estimates before you were made.

Mr. Archbold proceeds: "I will now present a statement showing the aggregate business done by the Standard Oil Company and by others in the United States for the five years 1894-1898, inclusive, in which it appears that the aggreate percentage of all business in petroleum and its products done by the Standard Oil Company was 82.3 per cent for this period of five years as against competitors' 17.7 per cent,

"Q. (By Mr. Smyth.) That includes all by-products. A. Petroleum and all its products."

Here are Mr. Archbold's figures:

Business of Standard Oil Company and Other Refiners, Years 1894-1898, Inclusive.

[Barrels of 50 gallons; all products, domestic trades.]

Year	Standard Oil Co.		Others		Total barrels
	Barrels	Per ct of total	Barrels	Per ct. of total	
1894	18,118,933	81.4	4,145,232	18.6	22,264,165
1895	18,348,051	81.8	4,084,720	18.2	22,432,771
1896	16,341,161	82.1	3,569,719	17.9	19,910,880
1897	18,141,479	82.4	3,876,706	17.6	22,018,185
1898	19,999,939	83.7	3,914,999	16.3	23,914,938
Total..	90,949,563	82.3	19,591,376	17.7	110,540,939

The commission will note that by ingeniously presenting this data for years preceding—now mark, preceding this absorption of the Cudahys and Manhattan refineries—that he made these figures do his falsifying for him, and apparently proved to you that my estimates were false.

And more and worse, on page 541 of his testimony, he further convicts himself of purposely deceiving and misleading the commission. He there gives what purports to be the independent refineries operating at that time. In that list, in addition to the above absorbed refineries and pipe lines, and the 26 refineries in that list which Scofield, Shurmer & Teagle, of Cleveland declare to be shut down and gone out of the business, he gives the Tide Water Oil Company, with its 43,150 barrels of still-refining capacity, as independent and outside of the Standard Oil Company's combination.

The Tide Water Company was the first concern that ever started in unhandicapped by railway discrimination and upon anything like even terms in transportation facilities in competition with the Standard Oil Company, their pipe line and railroad connections guaranteeing them equal transportation charges with the Standard Oil people, and since they whipped the Standard Oil Company into giving them a large percentage of the oil business they have become as much a part of the Standard Oil conspiracy against the producers and consumers of oil as Archbold himself. Everybody who is posted knows this, and yet Archbold has the impudence and audacity to impose on your honorable body this kind of testimony with the purpose of deceiving the commission and the country in an attempt to prove that my estimates were false.

He further testifies (preliminary report, p. 560):

"Mr. Lockwood testifies that by manipulation of price of Ohio crude oil, in conjunction with the railways, we succeeded in getting the price down to an abnormally low figure, and then bought substantially the whole Ohio producing field."

And here again Mr. Archbold uses figures to deceive and mislead the commission and the country.

For, mark you, it was not until the latter part of 1886 that the withering force of railway discrimination was applied to the man who had developed the Lima

oil field, and by July of 1887, after that withering force had been applied, they had forced the price of crude Lima oil down to 15 cents a barrel. At that time ,1887, the Standard Oil Company owned practically nothing in production in the Lima oil field. Think of what the financial slaughter must have been to force over 55 per cent of the producers to transfer their property to the Standard Oil people in a little more than two years. In some places nearly whole townships were sacrificed —transferred to the Standard. I know all about it. I was one of the producers who was obliged to sacrifice his property there.

Think of a financial condition brought about by monopolistic control of the price of wheat, for instance, among the farmers of a state that would force them in two short years, in order to save themselves from the sheriff, to give up to such monopoly over 55 per cent of their farms. Would it not be a pardonable extravagance for some farmer who happened to be in the thickest of it to testify?

"They held it at 15 cents a barrel in Ohio until they broke the hearts of the producers and then bought nearly the entire country upon that basis."

And here Mr. Archbold could sit cooly down in his office at 26 Broadway, surrounded by his high priced lawyers and statisticians, and compile this table of figures to prove what he wanted.

Here are Archbold's figures, expressed in barrels of 42 gallons:

Year	Pennsylvania Oil			Lima Oil			Grand Total		
	Total production	Standard Oil Co. production	Standard oil, per cent of production	Total production	Standard Oil Co. production	Standard oil, per cent of production.	Pennsylvania and Lima oil production	Standard Oil Co. production	Standard oil, per cent of production.
1890	30,065,867	2,618,637	8.71	15,014,882	8,400,568	55.95	45,080,749	11,019,205	24.44
1891	35,742,127	4,913,775	13.74	17,381,923	9,319,156	53.61	53,124,050	14,232,931	26.79
1892	33,332,306	4,338,822	13.02	16,685,193	7,843,324	47.01	50,017,499	12,182,146	24.36
1893	31,256,283	6,705,276	21.45	17,823,255	7,260,899	40.74	49,079,538	13,966,175	28.46
1894	30,696,716	7,210,345	23.49	18,575,603	6,690,951	36.02	49,272,319	13,901,296	28.21
1895	30,891,868	9,119,920	29.52	21,719,250	6,808,876	31.35	52,611,118	15,928,796	30.28
1896	33,908,041	9,380,654	27.66	25,222,091	8,031,793	31.84	59,130,132	17,412,447	29.45
1897	35,170,367	9,787,353	27.83	22,793,033	7,497,349	32.89	57,963,400	17,284,702	29.82
1898	31,645,151	11,248,443	35.55	20,266,328	7,220,606	35.63	51,911,479	18,469,049	35.58
Total..	292,708,726	65,323,225	22.32	175,481,558	69,073,522	39.36	468,190,284	134,396,747	28.70

The commission will especially note that these statistics given by Archbold did not begin until the year 1890, after the financial slaughter was over in Ohio, and the price of Lima oil had gone up. But they seem to prove to his satisfaction that the situation was not as bad as I had pictured it, he selecting his figures from such dates as to best deceive the commission and the country. Why did he not give his statistics for the years 1887, 1888, 1889? The answer is, "because they would have proved too much," and exposed the awful wreckage which in a little over two years enabled the Standard Oil people to get possession of over 55 per cent of the oil production of the Lima oil field.

His figures, however, are of service, for they prove that just in proportion as the producer is able to get a fair price for his product, that he is more than able to hold his own with the Standard Oil Company in the acquisition of property, for in 1895, when Lima oil went to $1.27 a barrel, the producers of Lima oil had been able to reduce the Standard Oil Company's percentage of production to less than 32 per cent.

Mr. Archbold further testifies, on page 561, that "Mr. Lockwood's statement * * * is so ridiculous as not to call for any answer." He takes exception to my attack upon the courts and upon the corruption of our public men by railroads and corporate interests, and then he takes the commission into his confidence and says: "I think you will agree with me that we must conclude that the fool killer has been very remiss in his duty in the vicinity of Zelienople, Pa."

And now, in conclusion, I desire to submit that when Mr. Archbold ruthlessly denies all facts and systematically and cunningly compiles figures and falsifies, as per his classification of the Tide Water Oil Company, that the commission must agree with the country that the knave killer has not done his full duty in the vicinity of No. 26 Broadway, New York.

And now I desire to repeat what in substance I said when I appeared and testified before your honorable body, that I have no combat against Mr. Archbold and his associates, for I do not believe that they are any worse than some other men might be, armed as they are with special privileges and advantages over the highways, the railways, of the country. I have no combat with men. My protest is against this accursed system of favoritism over the railways by which a few men, by the organization of trust combinations, can monopolize, destroy the equal rights of the citizenship, declare 48 per cent dividends on a three-times watered stock in 12 months, and thereby absorb the wealth produced by the many. M. L. LOCKWOOD.

Witness: Ira S. Zeigler.

I do solemnly swear that the above statement is true to the best of my knowledge, information and belief. M. L. LOCKWOOD.

Sworn and subscribed to before me this 14th day of May, A. D. 1901. IRA S. ZEIGLER,

[SEAL.] Notary Public...

State of Texas, County of Orange:

Before me, V. H. Stark, a notary public in and for Orange county, Tex., on this day personally appeared J. T. Stark, who, after being duly sworn, on oath de-

poses and says that he is a resident citizen of the United States of America, and is now a resident of the state of Texas, and has resided in the said state of Texas for a period of 44 years next preceding the date of this affidavit; that for a period of 10 years he has been a consumer of illuminating oil; that he now pays for said oil 20 cents per gallon; that for three years next preceding the filing of this affidavit he has not been able to purchase illuminating oil for a less price than 20 cents per gallon, and that said prices have been the regular price from the merchant to the consumer for said oil for the period above mention in Orange county, Tex.

That for a period of seven years next preceding said above three years he has paid 25 cents per gallon for said oil. J. T. STARK.

Sworn to and subscribed before me this 14th day of May, A. D. 1901. And I do hereby certify that affiant above subscribing is a credible person.

[SEAL.] V. H. STARK,
Notary Public, Orange County, Tex.

State of Texas, County of Orange:

Before me, V. H. Stark, a notary public in and for Orange county, Tex., on this day personally appeared T. H. Fountain, who, after being duly sworn, on oath deposes and says that he is a resident citizen of the United States of America, and is now a resident citizen of the state of Texas, and has resided in the said state of Texas for a period of 18 years next preceding the date of this affidavit; that for a period of five years he has been a consumer of illuminating oil; that he now pays for said oil 20 cents per gallon; that for five years next preceding the filing of this affidavit he has not been able to purchase illuminating oil for a less price than 20 cents per gallon, and that said prices have been the regular price from the merchant to the consumer for sail oil for the period above mentioned in Orange county, Tex. H. T. FOUNTAIN.

Sworn to and subscribed before me this 14th day of May, A. D. 1901. And I do hereby certify that affiant above subscribing is credible.

[SEAL.] V. H. STARK,
Notary Public, Orange County, Tex.

State of Texas, County of Orange:

Before me, V. H. Stark, a notary public in and for Orange county, Tex., on this day personally appeared N. Burton, who, after being by me duly sworn, on oath deposes and says that he is a resident citizen of the United States of America, and is now a resident of the state of Texas, and has resided in the said state of Texas for a period of 34 years next preceding the date of this affidavit; that for a period of 30 years he has been a consumer of illuminating oil; that he now pays for said oil 20 cents per gallon; that for four years next preceding the filing of this affidavit he has not been able to purchase illuminating oil for a less price than 20 cents per gallon, and that said prices have been the regular price from merchant to the consumer for said oil for the period above mentioned in Orange county, Tex. N. BURTON.

Sworn to and subscribed before me this 14th day of May, A. D. 1901. And I do hereby certify that affiant is a credible person and is at present district and county clerk of Orange county, Tex.

[SEAL.] V. H. STARK,
Notary Public, Orange County, Tex.

AFFIDAVIT OF HON. F. S. MONNETT.

Ex-Attorney General of Ohio, Columbus, Ohio.

To the Honorable Industrial Commission,
Washington, D. C.:

I beg leave to submit a reply affidavit to the scurrilous misrepresentations of a man by the name of John D. Archbold, testifying before your commission, as appears upon page 543 et seq.

ANSWER TO ARCHBOLD'S PRELUDE.

The State of Ohio, Franklin County, ss:

It is true that the Standard Oil Company is and has been interested in Ohio, as set forth in the prelude of Archbold's testimony; that certain corporations, like the Buckeye Pipe Line Company, the Ohio Oil Company, Solar Refining Company and the Standard Oil Company of Ohio are and have been duly chartered by the state, but I specifically deny that they are "carefully observing the obligations imposed upon them by their charter," but each and every one have openly and notoriously violated their charter, and have violated the statutes of the state, criminally and civilly, and are now so violating them, and did not dare to come into court and answer the charges of such violation as set forth in the petition in quo warranto and the interrogatories thereto attached, the Buckeye Pipe Line Company, the Solar Refining Company, and the Standard Oil Company of Ohio, other than filing such an affidavit to their pleadings as the inclosed one indicates, and as appears on page 34 of the supreme court record of the case, and which still stands in open and notorious defiance of the state laws.

COPY OF BUCKEYE PIPE LINE COMPANY'S JURAT TO ANSWER IN SUPREME COURT OF OHIO.

The State of New York, County of New York, ss:

Henry H. Rogers, being duly sworn, says that he is president of the defendant herein, a corporation, and that the averments in its foregoing answer are not verified because the admission of the truth of certain facts stated in the pleadings might subject the defendant and its officers to a criminal or penal prosecution and to a forfeiture of its charter, franchises and privileges, and for the same reason the interrogatories are not answered. HENRY H. ROGERS.

Subscribed and sworn to by the said Henry H. Rogers before me this 18th day of January, 1899.

JOHN BENSINGER,
Notary Public for Kings County.

Certificate filed in New York county.

They ceased to hold bona fide meetings in the state of Ohio of their directors and stockholders, as required by statute; they removed their principal office to 26 Broadway, New York, entered into and remained in the Standard Oil trust by part of the companies, continuing to nourish the trust certificates issued by the Standard Oil trust by paying dividends thereon, in open defiance of the court, for eight years; they escaped the contempt of the court for violating the original decree of the Standard Oil Company, wherein they were adjudged to have entered into the trust contract illegally, and escaped punishment in contempt by the supreme court of Ohio by a vote of three to three. The three judges voting to hold them in contempt were the three judges that were on the bench when the original decision was rendered. It is charged and uncontradicted that their influence defeated Joseph P. Bradbury for renomination as judge of the supreme court of the state of Ohio, who was known to be against their treatment of the court in this decree, and not until after his defeat and election of a judge in his place did they get a tie vote that failed to convict them. They have openly and notoriously evaded the taxes due the state by making returns upon their property, in many instances estimated at less than 10 per cent of its real value, considering the earning capacity of the property.

I reaffirm that on their own figures, as reported to the excise board, they shipped from the oil fields of Ohio to their various refineries an average of upward of 30,000,000 barrels per year, as appears in my testimony, on page 311 of the records of your commission, and that the gross receipts for refined oil and by-products received by the Standard Oil combination companies from Ohio's crude oil would reach $120,000,000 a year. I did not claim, as indicated in Archbold's reply, that any such amount was consumed in Ohio. It was the amount that was extracted from Ohio and mostly piped out of Ohio. If Archbold's testimony is as represented in its prelude on page 543, in which he says that the said corporations composing his combination of companies are "carefully observing the obligations imposed upon them by their charters," I wish to caution the commission against drawing any conclusions or deductions from any of his evidence; and his reiteration of this matter, after all that has been shown in the courts by the affidavits of their own officers and their conduct before the court and in the state legislature regarding the same, is most reprehensible.

I would like to characterize this absurd statement of Archbold's and his misrepresentation of the conduct of his companies in Ohio in much stronger terms, but I "bow to the wish of the commission."

He entirely misquotes Mr. Kinkead; at least, he misconstrues Mr. Kinkead's "satisfaction on his investigation." Mr. Kinkead demanded record and answers to the state's interrogatories that were never answered, but when Mr. Archbold undertakes such a large job of swearing as to malign, contradict, vilify and reflect upon Senator Theo. F. Davis, M. L. Lockwood, Mr. Lloyd, Mr. Phillips, Senator Lee, Mr. Emery, Theo. B. Westgate, David Kirk, Messrs. Dennison, Akin and Murphy and the whole army of witnesses, their victims and others that do not bow down their knee to worship at his oily shrine, and cry "Allah, Allah," at the altar of his by-products, I am not surprised that he would palm off such testimony upon the commission.

Looking at his testimony in the light of the various records as shown in the courts, in the face of the testimony of the other witnesses and of the company's refusal to testify when called upon to do so what strength or force can his testimony have as to what his corporations have done to obey the law in Ohio when these companies had an opportunity to demonstrate to the court that they were law abiding, but did not dare answer the interrogatories submitted to them for fear of penal or criminal presecution, as they allege, in Ohio.

BURNING OF THE BOOKS.

I submitted to the commission the sworn testimony of the witnesses who helped burn the books and of the draymen who helped haul them to the funeral pyre. I also gave them an opportunity to produce a single volume, whether daybook or ledger, covering the subject matter that was contained in the books burned. They never did produce them and openly refused to produce them under the court's order, and flagrantly subsidized 110 newspapers in the state of Ohio to protect them in their methods. Since said sworn testimony one of their traveling auditors or employes has admitted that he was out collecting the books and records that were shipped into the office and burned, and he himself was ordered, if subpoenaed, to answer no questions, but to go to jail in contempt. This employe said the state was "hot on their trail."

THE BRIBERY CASE IN OHIO.

I charged them before the supreme court with having attempted to bribe the Hon. D. K. Watson, former attorney general, and also myself as attorney general, as fully set forth in the complaint, and began taking testimony to establish the fact, but Mr. Archbold said in his testimony on page 544 that they had called upon the court to investigate the charges, and if the court did not investigate, they would. On the day I began to take the testimony to establish every allegation made in reference to the bribery in my reach, showing how the $400,000 was offered, and showing how $100,000 was offered to my predecessor, and giving all the details, telegrams and intermediaries, and all the evidence connected therewith, the chief justice of the supreme court, at the request of the attorneys of record of the Standard Oil Company verbally ordered me not to take the testimony, and the charges were thereafter dismissed by the court without hearing any of the testimony on the part of the state to establish the same. So that instead of the trust "courting investigation," they deliberately evaded and suppressed an investigation of these bribery charges, the court holding among other grounds that they had no jurisdiction over the question of contempt as charged, as to whether the Standard Oil Company was allowed taken, either by the company or the court, although the state stood ready to give a full exposition and exposure thereof.

Through their pipe line charges and by means of their monopoly in transportation, the Standard Oil combinations continue their monopoly in handling oil in Ohio, as every consumer of oil in this state can verify by his pocketbook.

Campaigns come and go, commissions investigate, and legislatures meet and adjourn, and magazine articles are written and read, and yet, through their monopolistic and criminal exactions, the Standard Oil combinations of transportation and distribution thereof levy tribute upon the owner of the oil rock and exact from the consumer of the refined oil and its by-products this unnatural profit. The public are its victims; the little band of law violators owning the controlling shares are the beneficiaries of the plunder. The public for a short time stand aghast at their very boldness and defiance. The government alone can check their abuses.

Subsidized papers and public officials bribed by these law violators will work their own ruin sooner or later. The exposure made by the industrial commission has had its wholesome place in this work, but some more drastic measures must soon be administered. The states have the sovereign power to protect all lawful efforts of organized wealth, but when the state creates the corporations that use their delegated powers for other purposes than the government itself could use them, it is time then to revoke such charters by the courts. This government was established to promote the "general welfare," not for the special welfare of a few magnates; neither can this sovereignty delegate its governmental functions to seven trustees to operate the government for their special welfare and for "their posterity."

No corporate creature of this government can deprive a citizen of his property through monopolistic combinations and exact an unnatural and an unconscionable tribute or excise from the consumer by this brute force, and long hold the public good will. Neither can this band of law violators long deny the common citizen the equal protetcion of the laws; neither can they destroy competitors' property at will without adequate compensation. They have shown little respect in Ohio for "vested" rights of competitors, and little respect for "vested facts" or "truth" in their reports and testimony from my views of this evidence.

F. S. MONNETT.

I swear that these statements made by me of my own knowledge are true, and that all other statements I believe to be true.

F. S. MONNETT.

Sworn and subscribed to before me this 6th day of June, 1901. L. R. PUGH,

[SEAL] *Notary Public, Franklin County, Ohio.*

AFFIDAVIT OF HON. JAMES W. LEE.

President Pure Oil Company, Pittsburg, Pa.

State of Pennsylvania, County of Allegheny, ss:

James W. Lee, being duly sworn, deposes and says, in answer to the statement made on page 507, volume 1, part II, of the record of the industrial commission:

It is not true that the said affiant acknowledged himself to be not only a member but the head of a trust. The company to which reference is made is the Pure Oil Company, and it is not now nor has it ever been in any sense a trust. It was organized to have exactly the opposite effect, to prevent, if possible, instead of securing monopoly. The fact that a portion of its stock is held in a voting trust does not in any way contribute to make it a trust. This voting trust was created for the express purpose of preventing monopolies in the business in which it is engaged from securing control of its business and destroying the small measure of competition which the said company affords in the industry in which it is engaged. These voting trusts had been employed for proper and laudable purposes long prior to the date at which modern trusts came into existence.

Affiant is not now nor ever has been connected with modern trusts—that is, corporation or combination of corporations intending to create and maintain a monopoly in and industry.

Affiant desires to reiterate the statement that the Standard Oil Company was absolutely opposed to the passage of the free pipe line law in Pennsylvania in 1883 and to the attempted passage of a similar law in 1879 and 1881. This was a matter of common and general knowledge at the time, and their agents forwarded hundreds of telegrams in opposition to the measure during the time of its consideration.

The letters submitted on pages 517 to 526 of the report are wholly inconsequential as proving the matter which they are offered to establish. They are in the nature of negative testimony. Affiant has knowledge of a case in which the general freight agent swore that no discrimination in rates were made, and then the honest auditor of said road testified and submitted written statements showing discriminations to the amount of thousands of dollars in said year.

Affiant further desires to call attention to the average price given for oil in New York, beginning in March, 1896, and says that the average prices were given for the month of March. The price he gave was 9 to 9½, which was the price on March 9, 1896, and the statement of the average price for March 7, 1898, on page 528, is simply confirmatory of affiant's statement of the rapid reduction in price after the Pure Oil Company began the sale of oil in the city of New York. On page 528 Mr. Archbold gives the average price for July at 6.23, while the affiant gave the price at 5½. The price given by affiant was correct, and Mr. Archbold found it necessary to give the average price of all their business for July in order to raise the price above this figure of 5½. The average price for July as given by him includes not only the sales made in July but their previous contracts for July, some of them possibly made before the Pure Oil Company began business.

Affiant says that the statement made by Mr. Archbold on page 530 that affiant approached the Standard Oil Company, or any of its officers or employes, seeking the sale of any portion of the independent inter-

ests, is wholly untrue. The only approach affiant ever made to an officer or employe of said company was made to the attorney of the company, and there was no suggestion of sale or even of combination, but simply that the Standard Company would cease to use the destructive methods which they were employing against the independent interests, stating to said attorney that this, if it was not, should be a free country in which any one, even with limited capital, should be entitled to engage in a legitimate business and to carry it on without efforts on the part of others engaged in the same business seeking by unfair methods to destroy it.

JAMES W. LEE.

Sworn to and subscribed before me this 11th day of June, A. D. 1901. JAMES S. CAMPBELL,
Notary Public.

AFFIDAVIT OF JOHN D. ARCHBOLD.

Vice President Standard Oil Company.

To the Honorable Industrial Commission,
Washington, D. C.

Gentlemen: I beg to submit the following affidavit relative to the new assertions contained in the affidavits of F. S. Monnett, Charles B. Mathews, M. L. Lockwood, and J. W. Lee, filed with you in June last. At the time I gave my former testimony the question of attempted bribery and burning of books was pending before the supreme court of Ohio for investigation, and I was instructed by counsel that it was not proper to go into details respecting these matters. The court has completely vindicated the Standard Oil Company from both charges, and has dismissed all the actions instituted against it by Attorney General Monnett. The attorney general, notwithstanding this result, reiterated before you his charges and reflected upon the purity of the court. I therefore desire the privilege of setting forth the facts shown by the court in some detail in order that you may judge between F. S. Monnett on the one side, and the supreme court of Ohio and the Standard Oil Company on the other.

BRIBERY.

The first public mention of the bribery charges came from George Rict in an interview at Marietta, which was given out to the newspapers on March 3, 1899. The last paragraph of this interview was as follows:

"In this connection it might be of interest to the citizens of the state to know that they have an incorruptible official in Attorney General F. S. Monnett, who within the past month has been offered the sum of $500,000, less $100,000, to be retained by the person attempting the bribery, to stop proceedings against the Standard Oil interests, and evidence has come to me from such source and in such manner that establishes this fact beyond the possibility of a doubt."

To his friends Monnett pretended surprise and expressed anger at Rice's disclosure. He told the court afterward that the story had been given Rice in confidence in the attorney general's office, and that Rice had givn it out because he had been goaded to anger by charges of blackmail.

The story was soon made prominent in all the newspapers. Reporters thronged Monnett's office and telegrams crowded his desk, urging him to tell what he knew about it. He put on a mask of fairness. He feigned hesitation, and told them the matter was in court and he did not "feel at liberty to discuss it," but before closing his mouth confirmed it in confidential parenthesis. He pretended it was true, concided the reported negotiation and figures, but concealed the name of the man who offered them. When pressed for the name, his usual reply was, "I do not think it a wise plan. If I were to give out his name, half a dozen different departments of the trust would be after him at once, and it might be they could force him or persuade him to keep his mouth shut, and in that case I might be placed in an unpleasant predicament.'

The Standard's attorneys, Kline and Elliott, after a few days of this mystery, addressed Monnett a letter on the 20th of March, as follows:

Hon. F. S. Monnett, Attorney General of Ohio:

On March 4, instant, George Rice announced to the public press that a bribe of $500,000, less $100,000 commission, had been offered you to induce you to stop or delay proceedings against the Standard Oil Company, now pending in the supreme court of Ohio.

You are reported to have entirely denied, at Toledo, the Rice story, but by the time you arrived at Columbus, on the evening of the same day, you concluded that the story was true, and accordingly in various newspapers on the morning of the 5th instant you made the statement that the Standard Oil Company, through some friend of yours, had offered you $400,000 to influence your action with respect to the cases pending against it and other companies in the supreme court of Ohio. Reputable newspapers of the state, notably the Cleveland Leader, the Toledo Blade, and the Ohio State Journal have called upon you to disclose the name of the "friend" who thus corruptly approached you.

You are reported in the Cleveland Plaindealer of March 7, as saying that 'if you were to give out the name of your friend, half a dozen departments of the trust would be after him at once, and it might be they could force him to keep his mouth shut.'

You do not seen to realize that the reason given by you for refusing to disclose the name of your friend is an admission that the company does not know the name of the party whom you say it commissioned to offer you $400,000 and therefore you must have known that the alleged friend made the offer to you without the authority or knowledge of the Standard Oil Company.

In the New York World of the 9th instant you are reported as saying that if you had written the friend who tried to bribe you that you would not expose him until public interest demanded it.

"In another interview in the Cincinnati Commercial

Tribune of the 6th inst. you are reported as saying that 'Your friend had agreed to protect you.' The arrangement for protection, therefore, seems to be mutual.

So far as any connection with the Standard Oil Company with any attempt to bribe you is concerned, it is totally false. You have the names, or claim to have, not only of the friend who approached you, but also of others acting with him, because ,on the 14th inst., you said in the public prints that these men were telegraphing you from New York.

While nothing in your story has directly connected the Standard Oil Company with the attempted bribery, you have desired the public to assume such connection. We now demand that you give the name or names of the person or persons who made such an offer to you, claiming to represent the Standard Oil Company, that we may take steps to quiet this last and most vicious of the many false and sensational stories to which you have given currency.

Respectfully, VIRGIL P. KLINE.
M. F. ELLIOTT,
Attorneys for Standard Oil Company.

After studying over the letter 25 days, on April 15, 1899, Monnett filed in the supreme court a paper which he called a bill of informal contempt. This bill contained not only a statement of what Monnett claimed was an attempt to bribe him, but contained allegations of an attempt to bribe D. K. Watson in 1890 by several mysterious persons, no names of such persons being given. It then referred to conversations at different dates between another mysterious person and Monnett, still failing to name the person.

The effect upon the public of an information of this character after the direct demand made upon him by the Standard's attorneys can be best judged by the following extracts from the newspapers of that day:

"The attorney general has filed the long promised statement of the attempt to bribe him by the Standard Oil Company. It is as unsatisfactory as the play of Hamlet with Hamlet omitted. He gives no names, but says that certain parties or a certain party offered to do so and so. What the public wants is the name of the briber and then proof that he was an agent of and authorized to act for the company. If it can be proven and is proved that the Standard Oil Company offered a bribe to the attorney General, there is not an honest citizen who will not insist on the punishment of the guilty man or men. "A certain party" may be nobody, or nobody with authority, a mere myth. Let us have the name of the briber and his connection with the company." (Sandusky Register, April 17, 1899.)

"Attorney General Monnett's bill of information is a disappointment. It fails to answer definitely the request of the Standard Oil Company's attorneys for the name of the man who is said to have attempted to bribe him in the interest of the company. Not only is the man not named, but the recital of the circumstances surrounding the alleged attempt to bribe the state officer is much weaker than the stories that have filled the newspapers. Instead of clarifying the matter, he has made it, if possible, more confused, and has prematurely invoked the aid of the supreme court. At no time has there been placed in the hands of the attorney general a better weapon than this, which he says he has, but seems afraid to use. Using it properly in his warfare against illegal corporations, he might abandon the other weapons, which it has been troublesome for him to employ successfully. Using this effectively, he would early have at his back a public sentiment that would do more than aught beside to further his crusade.

The boldness of the company's attorneys in demanding the name of the alleged bribe offerer and the failure of the attorney general to comply with that reasonable demand have certainly created a bad impression. The party from whom concealment would naturally be expected is not an officer of the law who has refused a bribe, but rather the company or individual whom the bribe offerer represented. Was the bribe offering a dream or a reality? The attorney general's information does no make it clear." (Columbus Dispatch, April 17, 1899.)

"Mr. Monnett, anxious to have the press promulgate his charge against the Standard Oil Company, and to have himself praised loud and long for refusing a princely sum, utterly ignored the claim of the people, made through the press, for the names of the alleged bribers. He had numerous excuses to offer, but declined to recognize the just demand, until, to bring the matter to a focus, the Standard Oil Company took the steps that forced Mr. Monnett to give the names of the alleged bribers, the manner of the reputed tender, and all other information connected therewith." (Cincinnati Times-Star, May 9, 1899.)

"The charge made by Monnett called for action—action against the agent who tendered the bribe and the principal who supplied the bribe. A crime had been committed and the duty of the attorney general of the state was to expose the criminal and to take such action as would bring him and the Standard Oil Company into court to be tried for a serious and reprehensible violation of the law. So far Mr. Monnett has declined to make known the man who sought to debauch him, and no effort has been exerted to punish the Standard Oil Company for seeking to bribe the attorney general of the state of Ohio." (Cleveland Leader, May 3, 1899.)

The more the attitude of Attorney General Monnett is examined into as regards the Standard Oil muddle, the more conscientious people of all classes question his consistency. That his conduct was inspired all the way through by a feeling of buncombe is plainly evident. He hoped by coping with the biggest corporation in the world to incite a feeling of admiration on the part of the trust-opposed people that would give him the nomination and land him in the gubernatorial chair. That the people are not falling over themselves to honor him indicates that they understand his motives and are not in sympathy with his political tricks, even if they would like to see some of the trusts brought under anti-trust laws. But in the case of the Standard

Mr. Monnett has not as yet proven, or came anywhere near proving that the company is any particular exseeding the prerogatives of its charter." (Fostoria Times, May 10, 1899.)

No process was issued upon the filing of this paper and no notification given the Standard Oil Company that it had been filed. But learning of the fact, the Standard's attorneys immediately went into court with the following motion, which appears in the records of the case. Notice of the filing of the motion was immediately given Monnett.

In the Supreme Court of Ohio.

The State of Ohio ex rel. D. K. Watson, Attorney General, Plaintiff,

vs.

The Standard Oil Company, Defendants.

No. 2294. Motion.

(Filed in supreme court May 4, 1899.)

Now come Virgil P. Kline and M. F. Elliott, attorneys for defendants in above case, in reference to a paper filed in above case by F. S. Monnett, attorney general, on the 15th day of April, A. D. 1899, and making known to the court that no notice has been given to the defendants of the filing of said paper, and that no process has been issued requiring an appearance, yet, being unwilling that such false, defamatory and libelous charges should remain among the records of this court without contradiction and in order that the falsity thereof may be made susceptible of proof they move the court:

I. That the attorney general be required to make the charges in paragraph designated "First" more specific and certain by naming the person who it is therein alleged requested Hon. Daniel J. Ryan to use his influence as therein stated.

II. That the attorney general be required to make the charges designated "Second," "Third," "Fourth," "Fifth," and "Sixth" more specific and certain by naming the persons who it is therein alleged made the offers and representations to D. K. Watson therein stated.

III. That the attorney general be required to make the charges in paragraph designated "Seventh" more specific and certain by naming the party who had the conversation with him therein referred to, and also by naming the "certain party" referred to in the telephone message from Cleveland, and by naming the "parties representing the Standard Oil Company" therein referred to, and by naming the three persons designated as "one of the stockholders of defendant company and two other people," and by naming the parties in New York who were telegraphed to from Columbus, as stated, and if any others are referred to therein as "representatives of the Standard Oil Company" that they be named.

IV. That a commissioner be appointed to take all legal testimony which bears upon the truth or falsity of the charges in said paper contained.

V. That a disinterested attorney be appointed to conduct the examination upon the part of the court.

In support of the requests contained in paragraphs IV and V of this motion, the attorneys for the defendant make the following statement upon information and belief, to wit:

That all the facts set forth in said paper, so far as they connect the defendant with any attempt at bribery or undue influence are false; that while Attorney General Monnett may have had conversations with some person connected with and unknown to defendant nothing therein occurred which gave the attorney general any reason to believe the defendant had any knowledge of or connection with the matter; that the attorney general has filled the newspapers with false and libelous reports of attempts at bribery on the part of the defendant, well knowing that there was no foundation for the same. That until the attorney general gives the name of his friend, defendant can not prepare to meet these charges, and that by reason of the facts alleged it is evident that both F. S. Monnett and S. W. Bennett must be witnesses in the case; that the attorney general is not disinterested and can only acquit himself of false and libelous statements and free himself from suspicion by proving defendant guilty of the charges he has preferred.

Wherefore it is highly improper and unjust that he, as representative of the court, should conduct the investigation.

STANDARD OIL COMPANY,
By VIRGIL P. KLINE and
M. F. ELLIOTT, its attorneys.

In the Supreme Court of Ohio.

The State of Ohio ex rel. D. K. Watson, Attorney General, plaintiff,

vs.

The Standard Oil Company, defendant.

Cause No. 2284. Notice of motion.

(Filed in the supreme court May 4, 1899.)

To Hon. F. S. Monnett, Attorney General of Ohio:

You are hereby notified that the defendant in the above cause has filed therein a motion to require you to make certain allegations in the paper styled "A bill of information in contempt," filed by you therein on the 15th day of April, 1899, more specific and definite; and also asking the court to appoint a commissioner to take all legal testimony bearing upon the truth or falsity of the charges in said bill of information in contempt contained; and to appoint a disinterested attorney to conduct the examination relating to the charges in said bill of information in contempt set forth, on the part of the court.

Said motion will be for hearing at 8:30 a. m. on the 18th day of May, 1899.

Dated this 4th day of May, 1899.

LAWRENCE T. NEAL,
Of Counsel for Defendant.

I hereby acknowledge service of the above notice this 4th day of May, 1899. We ask for an earlier hearing of motion.

F. S. MONNETT,
Attorney General.

Forced by this motion and notice, Monnett filed what he termed an amendment to the complaint in contempt, in which he confessed his inability to name the persons referred to as approaching Watson, and in which he named Charles B. Squire as the friend who had approached him. This Charles B. Squire, let it be remembered, was the intimate friend of F. S. Monnett, had no connection, and never had, with the Standard Oil Company, and no acquaintance, so far as we can learn, with any of its leading members.

Charles B. Squire immediately caused the following explanation of his connection with Monnett to be published. Whether it is true or not, the Standard has no means of knowing, as it is in utter ignorance of the whole affair, and Mr. Monnett and his friend must settle this question of veracity between them:

If Attorney General Monnett in his statement to the court of Ohio, said that I offered him a bribe, as representing the three men he mentions it is absolutely and unqualifiedly false.

I know nothing about the statement you say the attorney general has made, but he surely could not have said that I offered him a bribe of $400,000 or any other sum as representing men from the Standard Oil Company, or anybody else. I never offered a man a bribe in my life, and if anybody says I did he tells an untruth.

What I have said before is true. I had been approached by a promoter of schemes and warned the attorney general to beware of him. I do not believe the man in question ever had any connection with the Standard Oil Company, or represented it in any way in his offer. He was merely "fishing" in the hope of getting something for himself. I thought at the time he might have been representing the Standard, and that is why I warned Mr. Monnett to keep away from him, and by all means not to resign or drop the prosecution, as the talk would be that he had been bribed.

Later I learned that the man had no connection with the Standard Oil Company; that he was a promoter and evidently had tried to approach the attorney general merely on his own hook, and without any authorization whatever from the Standard Oil Company.

I can not understand why the attorney general—if he did so—could say I attempted to offer him a bribe. It is absurd and untrue. The contrary is the case. I warned him to beware of certain persons that might possibly lead him into a trap. (Charles B. Squire in a statement to the Press last night.)

This was the state of the record on September 8, 1899, when I was called before the industrial commission. I said in relation to the bribery charge that "we had answered the charge of bribery and our answer was before the supreme court. We court an investigation. We deny it (the bribery) to the very uttermost."

Monnett, in his affidavit filed in June, 1901, with the industrial commission, says:

I charged them before the supreme court with having attempted to bribe the Hon. D. K. Watson, former attorney general, and also myself as attorney general, as fully set forth in the complaint, and began taking testimony to establish the fact, but Mr. Archbold said in his testimony, on page 544, that they called upon the court to investigate the charges, and if the court did not investigate they would. On the day I began to take the testimony to establish every allegation made in reference to the bribery in my reach, showing how the $400,000 was offered and showing how $100,000 was offered my predecessor, and giving all the details, telegrams and intermediaries, and all the evidence connected therewith, when the chief justice of the supreme court, at the request of the attorneys of record of the Standard Oil Company, verbally ordered me not to take the testimony, and the charges were thereafter dismissed by the court without the hearing of any testimony on the part of the state to establish same.

Compare with this statement the record as I have disclosed it. Consider the motion made on May 4, 1889, that a commissioner be appointed to take the testimony, and that a disinterested attorney be appointed to conduct the examination upon the part of the court, and notice the reasons given for said motion, to wit, that "the attorney general has filled the newspapers with false and libelous reports of attempts at bribery on the part of the defendants, well knowing there was no foundation for the same," and that "it is evident that F. S. Monnett and Bennett must be witnesses in the case," and "that the attorney general is not disinterested and can only acquit himself of false and libelous statements and free himself from suspicion by proving the defendant guilty of the charges he has preferred. Wherefore it is highly improper and unjust that he should, as a representative of the court, conduct the investigation."

Can it be possible that, pending that motion, and oblivious to the reasons given in its support, without awaiting the action of the court, Monnett, did, as he swears, "begin taking testimony to establish the fact?" How could he begin to take testimony when the court had appointed no commissioner to take it, and how dare he begin to take testimony when the record showed he was a party implicated and could only clear his own character by proving the guilt of the defendant? The plain fact is that he did not begin to take testimony, as he swears. But it is true that, utterly regardless of his duties as an attorney and as a representative of the court, he did give notice that he would take testimony before a notary public, a proceeding which he knew to be illegal, preposterous and contemptuous. This notice of an intended illegal proceeding was brought to the attention of the court in

the proper manner, and the court very properly peremptorily stopped it.

These are the facts to prove the falsity of Monnett's oath that "instead of the trust courting investigation, they deliberately evaded and suppressed an investigation of these proper charges." The motion for an investigation was made in good faith and pressed in good faith, and it was not until December, 1899, that the court unanimously entered the following order:

It is ordered that the information herein filed by the attorney general on the 15th day of April, 1899, be stricken from the files, it not appearing that there is any competent evidence to connect the defendant with the alleged offer to the attorney general.

It is only necessary to add to this record the now well known fact that the original action against the Standard Oil Company for contempt, instigated by the attorney general at the request of George Rice, was afterwards dismissed by the court, and that the present attorney general of the state of Ohio, after carefully considering all the evidence taken by Attorney General Monnett in the various other cases instituted by him against the Standard, moved for the dismissal of the cases, which motion was promptly granted by the court. Nothing was left for Monnett but the usual rule, when an attorney has lost his case, but to abuse the court which had decide dagainst him.

BURNING BOOKS.

Monnett's charge that the Standard Oil Company burned its books was first published in Cleveland, Ohio, newspapers on the evening of December 21, 1899. This charge was promptly and completely denied by Kline, Carr, Tolles & Goff, attorneys for the Standard, in the following letter:

Editor the Cleveland Press:

The charge or insinuation made by Attorney General Monnett that the Standard Oil Company has burned or destroyed any of its books is absolutely false. It is simply based upon the fact that the company, from time to time, destroys useless material which accumulates in its business, as is the case with every other large corporation or business house. This it does openly and has always done.

The attorney general having learned of such a transaction occurring in November, has undertaken to create an impression through the public press that this was an attempt on the part of the company to evade the order of the supreme court, an impression which is entirely unfounded.

In view of the notice you have given the public in this matter, we trust you will kindly publish this statement.

Very respectfully,

KLINE, CARR, TOLLES & GOFF.

A few days thereafter Monnett revived the charge and for the first time used it officially in a paper filed with the supreme court in an application for issuing further process and for the removal of Commissioner Brinsmade.

In that paper Monnett said:

The state is informed and believes that many valuable records and documentary evidence have already been destroyed since the former adjournment of said referee on or about November 15, 1898, and the order of said court on December 7, 1898.

While this slander was new, Mr. Kline, in the presence of the court and the attorney general, in discussing the question of producing books, said to the court:

Now, your honor has inquired whether we have books showing the gross earnings and disbursements of this corporation. Yes; and all its business detail in all its relations to all the world, and this talk about destruction is the merest chaff. We are glad to have an opportunity to meet in this tribunal the claim that books have been destroyed. The attorney general may send to this court every single scrap of testimony, whether it be signed or not. There is an intimation of collusion, or that the master has acted unfairly and that we are destroying valuable records. Of course these falsehoods will get around the world before the truth can get after them. But we can satisfy this court and we owe it to this court.

According to Monnett's testimony before the industrial commission at Washington on May 16, 1899, five months afterwards, the original basis of this charge was anonymous. On this point Monnett then and there testified:

We received an anonymous communication that they had burned their books. We subpoenaed certain parties and had them testify to the fact. The information to the state, after following up the matter, was that they had burned 16 boxes of books. I give you Mr. McNirney's testimony touching upon the subject:

"Question. (By Mr. Jenks.) You believe that those books that were burned were the ones you required Mr. Squire to produce? A. That is the fair legal presumption from the testimony, considering the size of the books, the size of the boxes, the number, the circumstances and the refusal to produce them afterwards, although Mr. Kline in open court stated that they had not destroyed them, that they had them yet, and that they would not produce them on the request of the chief justice of the court. They absolutely refused to produce them, and relied upon their constitutional privilege to refuse to answer. The exact testimony as to burning of the books I will furnish you for your own conclusions."

Compare the testimony of Monnett in Washington and his charges in Ohio, with the following testimony taken by him in the case:

McNirney testified:

I am employed by the Standard Oil Company as car builder and repairer. On or about November 19,

1898, was ordered to and did help load boxes of books and sacks from the general offices of the Standard Oil Company on Euclid avenue, Cleveland, into a wagon to be hauled to the warehouse of the Standard Oil Company at their No. 1 works. Moran helped me in the loading. There were 16 boxes in all. Moran is a car builder and laborer. We burned some of the boxes the next Monday. We did not burn them all; think we burned all we took out. We also burned papers and letters in the sacks. I think we burned nine chests and six sacks. Those sacks were all letters and copying books, I should think, or something like them. Loose paper, waste paper, I say. Moran helped me throw them in the furnace. Moran helped me through the whole transaction. George Field, the car shop foreman, gave me the order to go to the general office, and also to do the burning. We went to the office about 9 or 10 o'clock in the morning. Don't know whether the books were tagged for the car shop hill or just "Chas. Hogan" for distribution. Charles Hogan is general superintendent. He can tell you more about this book burning than I can.

On cross examination McNirney said:

Everybody in the shop knew that those books were destroyed, and those papers, and they all understood that they were waste paper, as we understood it. There was no secret about that, no secret about this case at all. All the employes in the car shop knew that those books and papers were destroyed and understood they were waste paper.

On the same day Charles Hogan testified that—

His place of business was the Standard Oil Company's No. 1 works. Had charge of the mechanical department. On or about November 19, 1898, gave instructions to George Field to have him send to the general offices for boxes. Order to me to send for them came by telephone from the general office. Saw the boxes and personally inspected the burning of the contents. The boxes contained miscellaneous lot of paper, letter press copying books, etc. The contents were burned in the furnace.

Cross examination:

Have been at No. 1 works 21 years. It is a very common occurrence to burn accumulations of waste paper. This kind of stuff was of same character as on previous occasions. Was ordered to burn nothing less than 10 years old. This was the old accumulation gotten out of the block at the time of changing office rooms, occupying two floors instead of five.

William Moran testified:

Work for Standard Oil Company as car repairer. Went with John McNirney and teamster to Standard Oil Company offices to get boxes—about 16 boxes; took them to storehouse; left them in Hogan's charge. There were boxes and sacks. The following Monday morning we burned a lot of scrap paper. It was 9 or 10 o'clock on Monday morning. John McNirney assisted me in burning the books. We also burned similar stuff a year or a year and a half ago. This was done before the employes and no effort at secrecy. Nothing unusual about the transaction of burning this waste stuff, and no suggestion from Mr. Hogan or anybody that it was to be kept secret.

In addition to the foregoing statement taken by Monnett there were submitted and read in his presence two affidavits, one by Charles C. Hogan and the other by S. H. Tolles, the substance of which is as follows:

HOGAN'S AFFIDAVIT.

In the Supreme Court of Ohio.

The State of Ohio ex rel. F. S. Monnett, Attorney General, Plaintiff,

vs.

The Standard Oil Company, Defendant.

Affidavit. Filed in Supreme Court.

The State of Ohio, Cuyahoga, ss:

Charles C. Hogan, of lawful age, being duly sworn, upon his oath says that he is in the employment of the defendant and has charge of the mechanical department of its No. 1 works; that he has been in the employment of the company since November 1, 1878.

During all that time it has been the practice of the company, currently, every two or three months, to burn up accumulations of waste paper and books from its general offices, the quantity of material thus burned having been currently much larger prior to 1891 than since that time, by reason of the fact that about that date the company's business became much reduced.

It is the practice at the company's office to keep all invoices, reports and other like transactions in tissue paper impression books, which are kept during the current month and until the transactions therein contained get on to the company's regular books, after which time they are useless, and at the end of the current month, after the book entries are made, are thrown aside. These books, together with the accumulations of reports, incoming invoices which have been transferred to vouchers, and other accumulations of waste paper, have been, during all the time of affiant's connection with the company, at current intervals, destroyed by fire. This has been the case with all waste accumulations except such as had one blank side and could be used over again, which are sent to the printing department, cut up and worked into pads for miscellaneous purposes. A considerable quantity was formerly burned at the boiler of the company's candle works. The furnace, however, being of small capacity, three or four years ago, while waste paper was being burned there, fire was communicated to the works and they were burned down. Since that time

all refuse has been burned at No. 1 works, either at the cooper shop or the pumping station boilers, the capacity of the furnaces at those places being larger and the burning attended with little risk. During the time of my connection with the company, portions of the refuse material have been burned at the No. 1 works, and since the date last named all has been burned there. Prior to 1889 the material there destroyed was burned at what was known as No. 1 boilers, which were then located directly in the rear of the company's office at the works and conveniently adjacent thereto. In 1889 these boilers were dismantled, leaving the only places for such burning the boilers at the cooper shop and the pumping station. Affiant has seen such burning during those years a number of times.

Prior to 1896 the general office of the company on Euclid avenue occupied five floors of the Standard block, so called, and had a large quantity of vault room in which were stored accounts and records of the business dating back to the organization of the defendant corporation, and to the time of Rockefeller, Andrews and Flagler, in 1863. In 1896 the general offices of the company were consolidated upon two floors of the building it had formerly occupied, so that it became necessary to find a storage place for a large quantity of these accumulations, which were then brought out and then placed in the old warehouse at No. 1 works, and thereafter, from time to time, such records and books as were not of the character above described as currently destroyed were brought out and placed in the storehouse, so that its capacity became overcrowded. These books were loaded into wagons, brought out and stacked up in the warehouse, and being crowded for room affiant applied to the auditor of the company to make some disposition of old records, account and letter books of which in his judgment there were at least 20 cords piled up in the warehouse, so as to get them out of the way, and received in reply to his complaint a communication from the auditor of the company, bearing date March 15, which was as follows:

"Subject: Storing books and papers.
"Mr. C. C. Hogan, No. 1 works.

"Dear Sir: Referring to your favor of March 14, Mr. Kline says that we may destroy all books of account, vouchers, as well as miscellaneous books, reports, etc., that are over six years old. I believe, however, that we had better modify this somewhat, and that you had better keep all books of account, mainly ledgers, journals and cash books, that are not more than 10 years old for the present, at least. You may destroy everything that is older. All letter books, letter files and miscellaneous books and reports, cancelled checks, which, I believe, represent the bulk of stuff stored in the old warehouse, you may destroy up to the six year limit. This will reduce the amount of shelving you require."

Thereupon affiant went through the storehouse and personally superintended the selection of books and papers for destruction at that time. He personally examined every book of account which was set aside for destruction and destroyed, and of his personal knowledge knows that no book of account which was not more than 10 years old at that time was taken out and destroyed. Impression books, letter files, miscellaneous books and reports, cancelled checks and papers of that character that were more than six years old he set aside and had burned with the books of account and other refuse matter selected by him.

He knows from his personal examination and selection that there were destroyed no books of account less than 10 years old, and no other material less than six years old, all books and papers within those limits remaining in the warehouse; that between that time and November, 1898, from time to time, there was sent out and burned waste material of the kind herein described, but no books of account, and about November 9, 1898, another lot of refuse matter, which has been spoken of in the testimony taken before H. C. Mason, notary public. The quantity then burned was not larger, nor was its character other than that which currently comes out and is destroyed. Since that time —and while the testimony was being taken before Mason, the notary public—another batch of refuse has been sent out and destroyed at the cooper shop furnace. At none of these times has affiant known of books of account being burned, except at the time above mentioned by him.

There never has been secrecy about the destruction of this refuse matter. It has always taken place in open day and in the presence of a large number of defendant's employes, and conducted by men not specially selected for the purpose, but any of the company's workmen who might happen to be detailed by their foreman therefor. Affiant has never had any instructions as to secrecy, nor have any ever been given by him, and he has never known of anything being burned except waste and refuse material.

CHARLES C. HOGAN.

Subscribed and sworn to by said Charles C. Hogan before me this 3d day of January, 1899.

[NOTARIAL SEAL] H. O. JONES,
Notary Public.

In the Supreme Court of Ohio.

The State of Ohio ex rel. F. S. Monnett, Attorney General, Defendant,

vs.

The Standard Oil Company, Defendant.

Affidavit. Filed in Supreme Court January 5, 1899.

The State of Ohio, Cuyahoga, ss:

S. H. Tolles, of lawful age, being first duly sworn, upon his oath says that he is an attorney at law and a member of the firm of Kline, Carr, Tolles & Goff, attorneys for the defendant in the contempt proceedings herein; that regardless of the orders heretofore made appointing a commissioner before whom parties to this contempt proceeding were directed to take their evidence in this action, the attorney general, late in the

evening of December 19, 1898, served notice upon affiant's firm that depositions would be taken in this proceeding in the office of Harry C. Mason, in the city of Cleveland, on the 21st day of December, 1898, and caused subpoenaes to be issued by the said Harry C. Mason, as notary public, for sundry witnesses to appear before him at that time.

That said Harry C. Mason is, in fact, one of the attorneys for the state, being one of the counsel appointed under the provisions of law by the food commissioner and the attorney general to represent the state in the prosecutions brought for violations of the pure food laws.

That thereupon, at the time fixed in said notice, and over the protest of affiant as such counsel the attorney general proceeded to examine witnesses before said Mason, acting as such notary public; that there were present on said day at such hearing Victor Bkorklund, an engineer; Charles Anderson, a foreman; Denman Bolton, a night watchman; C. A. Birch, a night watchman; and Nels Anderson, a fireman, all in the employment of the Cleveland Arcade Company, of Cleveland, Ohio, who were examined upon some supposed theory that some books of the defendant had been burned under boilers of said Arcade Company.

In addition thereto, one Ludwig Darmstaetter, a Bohemian rabbi, was examined by the attorney general, and testified that, being one evening in a saloon he overheard some Bohemians talking about hauling papers and books from the Euclid avenue office of this defendant to its works.

There were called by him also one Edward O'Hearn, employed in the car shops of this defendant, and one Cornelius O'Hearn, employed in the car shops of this defendant; to prove that on or about November 19 they assisted in hauling some boxes and sacks of loose paper from defendant's office to the warehouse at its No. 1 works.

The hearing then adjourned to the following day, Thursday. Thursday morning the attorney general produced Emanuel Pollack, a saloon keeper, from whom Edward O'Hearn rented rooms, who testified that O'Hearn, the teamster, returned home on the evening of November 19, being a little late, he said he had been hauling some boxes.

Also a witness, John McNirney, whose testimony occupied about 30 printed pages, testified that on the morning of November 19 he assisted in burning up some books and papers at one of the furnaces of the defendant; went down to the block later in the day and hauled some sacks and boxes of loose paper to the warehouse, and on Monday morning assisted in burning some sacks of loose paper and some of the contents of the boxes in one of the defendant's furnaces. He wound up his testimony with the statement that there was no secret about the transaction; that all the employes of the car shops knew of the burning, and supposed and understood that what was being burned was waste paper. The witness further testified that the burning was done in the forenoon, in broad daylight, and in the presence of the hundreds of employes of the defendant's car shops.

At the conclusion of the taking of the testimony of McNirney the hearing was adjourned until 4 o'clock at which time the attorney general examined Charles C. Hogan, superintendent of the defendant's No. 1 works, who testified as to the burning of waste paper and impression books, and to the fact that there was nothing unusual in the transaction.

Thereupon, it having appeared in the testimony of the witnesses examined that one Moran, an employe of the defendant, assisted McNirney in the work done by him, and they had been designated for this service by George Field, foreman of the defendant's car shops, and that men named Gabeline, Schaff and Becker assisted in the teaming of the boxes from the defendant's office to the works, the attorney general announced that they had been endeavoring to serve these people with process, but were unable to do so, and would be obliged to adjourn until the next day, Friday morning at 10 o'clock, intimating, as usual, that the defendant was keeping these witnesses hidden.

Thereupon affiant produced the witnesses Moran and George Field, for examination by the attorney general, and also, having ascertained the names of the firemen at each of the furnaces at which burnings were had, and of the clerk who had superintended the burning at one of the furnaces, Mr. Hogan having superintended it at the other, produced to the attorney general the two firemen and the clerk in charge, whose name was Stanbury. Gabeline, Shaff and Becker not then being at work for the defendant, affiant was unable to produce them.

Thereupon, on the morning of Friday the attorney general examined the witnesses Field and Moran, but declined to examine the fireman and clerk, who were the only other witnesses who had anything to do with the transaciton directly, but, inasmuch as affiant had failed to get the witnesses Shaff, Gabeline and Becker, announced that they were the only ones whom he really cared to examine, and the hearing was adjourned until these witnesses could be found.

Thereupon affiant, having ascertained the homes of the witnesses Gabeline and Shaff, sent for them so that they might be examined, desiring that any person who knew anything about the transaction might be accessible to the attorney general; but on inquiry at the office of Mr. Mason it was learned that the hearing had been adjourned until Saturday morning at nine o'clock; that upon attending said hearing at said hour it was ascertained that the attorney general had the night before left the city.

A transcript of the evidence given by the witnesses examined by the attorney general before the notary public is annexed to and made a part of this affidavit, so that the court may see the character thereof.

Affiant believes that said pretended taking of depositions was not done in good faith, with the design of using same in court, and that none of the matters therein contained are material, relevant or important to any issue in this action, but believes that the same were taken without design of using them as evidence herein, but merely as a fishing expedition.

That during the taking of said testimony and upon December 22, 1898, at about 10 o'clock, the attorney

general said to the affiant that it was then time to adjourn and go over to the commissioner, who was ready to begin taking testimony. Affiant replied that the defendant had no notice that the taking of any testimony before the commissioner was designed, except as the statement had appeared in the morning paper of that day; that the attorney general was that morning going to have the books of the defendant produced and examine its officers, and the attorney general left the office of the notary to attend said hearing. Affiant was not present before the commissioner, but attaches hereto and makes a part hereof a stenographic account of what took place at that time. S. H. TOLLES.

Sworn to before me by the said S. H. Tolles and by him subscribed in my presence this 3d day of January, 1899. C. H. GALE,

[NOTARIAL SEAL] Notary Public.

The foregoing are the substantial parts of all the evidence given by the witnesses in the matter of burning books.

Consider Monnett's treatment of the facts above recited.

In his testimony before the industrial commission on May 16, 1899, with all this evidence known to him, he submitted to the commission only the testimony of McNirney in direct examination, which closed with the question by Monnett in the form of a statement, as follows: "I was informed he could, but we have not been able to subpoena him yet," meaning that they had not at that time been able to get the testimony of Hogan who, according to McNirney, "could tell more about it than he could."

Is it not clear that Monnett intended to have the commission believe that Hogan had not testified, and that the principal witness to the charge of burning was McNirney, when, as a matter of fact, Hogan testified on the same day that McNirney did, was the next witness, was voluntarily produced by the Standard, and was examined by Monnett? He suppressed that part of the evidence known to him of McNirney, and the evidence of Hogan and Moran, all to the effect that the stuff burned was waste paper and old books, the testimony of Hogan and Moran that such destruction of old books and papers was of frequent occurrence and submitted the first part only of McNirney's testimony, closing with his own question in the form of a statement to the effect that they had not been able to get Hogan, who knew more about the burning than McNirney did. There was in his evidence both suppression of truth and suggestion of falsehood; and now after two years granted for reflection and repentance, thoroughly discredited by the records of the court he represents, he again returns to the charge in his affidavit filed before the commission in June, 1901, pretending he has found new evidence. I leave him face to face with the record that the commission may judge.

JAMES W. LEE.

In relation to the denial of James W. Lee that the Pure Oil Company is not a trust, it is only necessary to call attention to his definition of a trust, to wit: "A corporation or combination of corporations intending to create and maintain a monopoly in any industry. Under this definition there are no trusts. Mr. Lee admits that a portion of the stock of the Pure Oil Company is held in a voting trust. I am informed by able lawyers that a voting trust has been held to be illegal as often as the question has been raised in the courts, including the highest court of New Jersey, the state in which the Pure Oil Company is organized. I desire to reiterate my former statement as to approaches to us of many connected with the Pure Oil Company in relation to sale and combination and to say that Mr. Lee's suggestion did include a combination of interests of the competitive pipe lines.

M. L. LOCKWOOD.

My former testimony, which gave statistics and figures in refutation of wild statements of M. L. Lockwood, need only be referred to as an answer to his subsequent affidavit. One point, however, deserves some comment, as certain newspapers have already been misled by Mr. Lockwood's statement. The New York World on June 21, 1901, announced editorially that "affidavits just submitted to the industrial commission by M. L. Lockwood, of Buffalo, afford evidence to the effect that at a certain date the Standard Oil combine was shipping its tanks to Germany at two cents per gallon, while at the same time it was charging its customers in Texas and Arkansas, where it has no competitors, 25 cents per gallon." This was the substance of Mr. Lockwood's original statement to the commission, and it was denied by me. In his last affidavit he reasserts the truth of his former statement and attempts to establish it by showing—

1st. That the independent refiners exported oil which after deducting commissions and other expenses, netted the refiners something over two cents per gallon. This is very far from proof of the assertion that oil is put into tank steamers for Germany at two cents per gallon. The wayfaring man, though a fool, should see the difference between a selling price and a net profit. If the independent refiners netted two cents per gallon they did remarkably well. Further to sustain the assertion under oath that the monopoly forces the people of Texas to pay 25 cents per gallon for oil burned in their lamps, he produced affidavits from residents of Orange county, Tex., and Orange county, Fla., that the usual price of a five-gallon can of oil in those counties was $1. Suppose this to be true. How does it show that the monopoly, aided by the railways, forced that price? That was the retail price in a remote region, and how many middle men's profits had been added to the wholesale price is not shown. Besides, oil transported such a distance in cans is not expected to be the cheapest. It is transportation in bulk that enables oil to be retailed cheaply at distant points. The result of Mr. Lockwood's statement is that neither the Standard Oil Company nor any of its competitors sold oil for Germany at two cents per gallon, and that monopoly, backed by railway favoritism did not force the people of Texas and Arkansas to pay 25 cents per gallon for oil they burned in their lamps.



CADWALLADER—ANCHOR OIL COMPANY

(Well No. 1, Lot 647, Before the Fire). Cherry Grove, Warren Co., Pa.



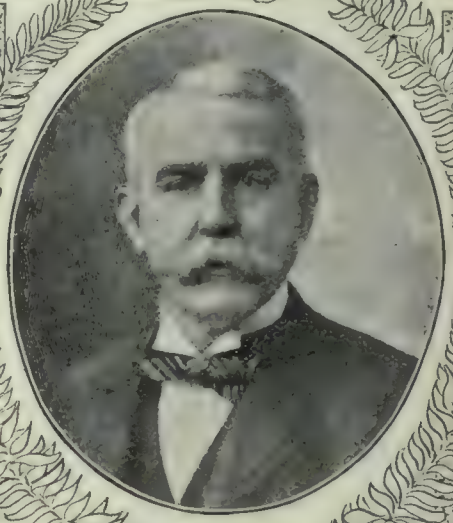
MICHAEL MURPHY
INDEPENDENT OIL PRODUCER AND REFINER
PHILADELPHIA PA.



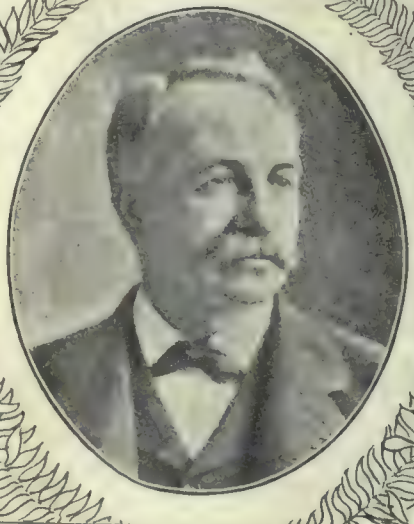
JAMES W. LEE.
INDEPENDENT OIL PRODUCER AND REFINER
PITTSBURG PA.



DAVID KIRK
INDEPENDENT OIL PRODUCER AND REFINER
PITTSBURG PA.



E H JENNINGS
INDEPENDENT OIL PRODUCER AND REFINER
PITTSBURG, PA.



HUGH KING
INDEPENDENT OIL PRODUCER AND REFINER
NEW YORK

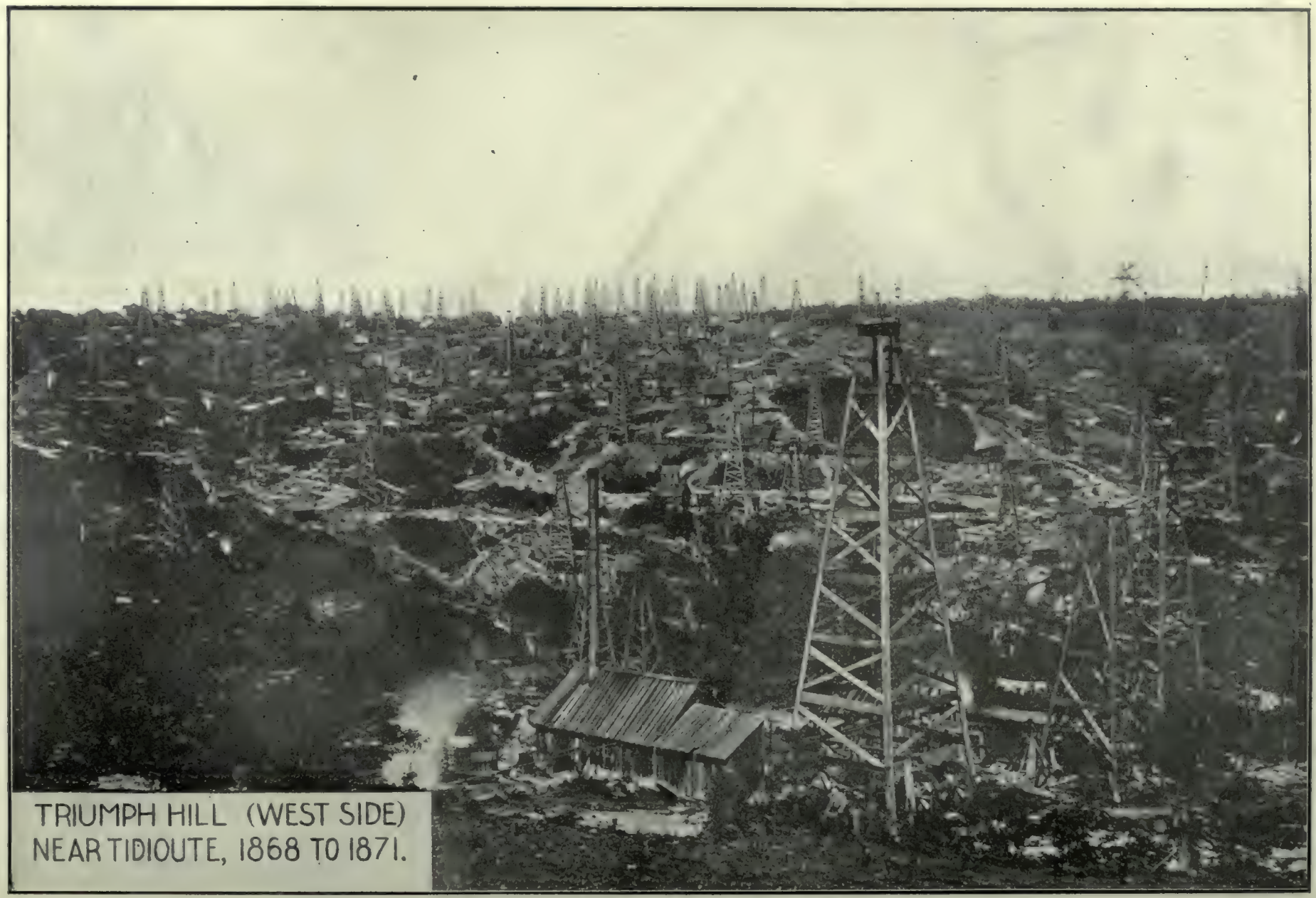


CLARENCE WALKER
INDEPENDENT OIL PRODUCER AND REFINER
BUTLER PA.

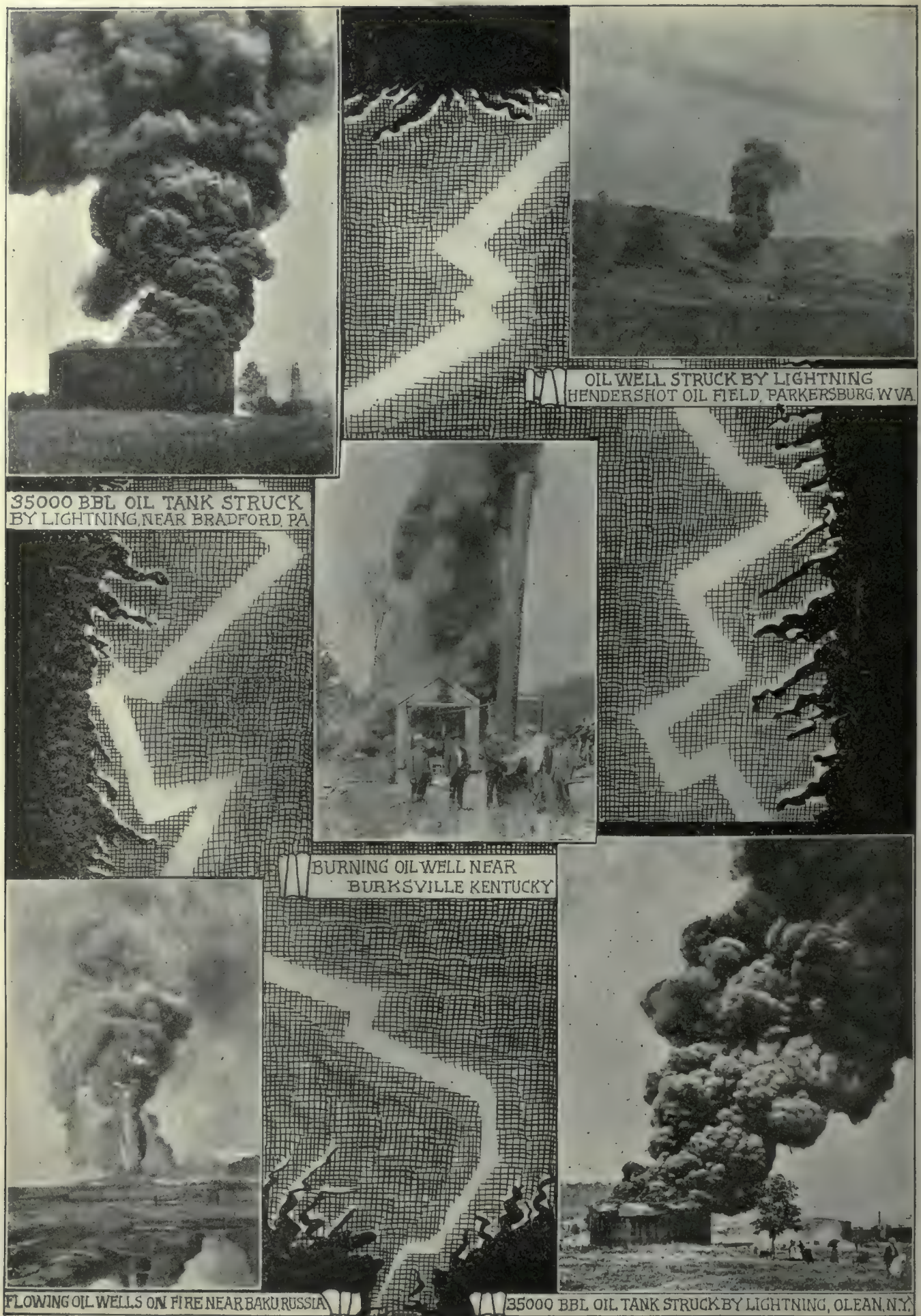

SENATOR LEWIS EMERY JR.
INDEPENDENT OIL PRODUCER AND
REFINER, BRADFORD, PA.
THOMAS W. PHILLIPS
INDEPENDENT OIL PRODUCER AND
REFINER, NEW CASTLE, PA.
CAPT. WILLIAM HASSON
OIL CITY PA. PRESIDENT OF THE PETROLEUM
PRODUCERS ASSOCIATION IN 1872.
PETER THEOBALD.
INDEPENDENT OIL PRODUCER AND
REFINER, TITUSVILLE PA.
LATE A.D. WOOD.
INDEPENDENT OIL PRODUCER AND
REFINER WARREN PA.



TRIUMPH HILL (EAST SIDE)
NEAR TIDIOUTE, IN 1871.



TRIUMPH HILL (WEST SIDE)
NEAR TIDIOUTE, 1868 TO 1871.


OIL WELL STRUCK BY LIGHTNING
HENDERSHOT OIL FIELD, PARKERSBURG, W VA.
35000 BBL OIL TANK STRUCK
BY LIGHTNING, NEAR BRADFORD, PA.
BURNING OIL WELL NEAR
BURKSVILLE KENTUCKY
FLOWING OIL WELLS ON FIRE NEAR BAKU, RUSSIA
35000 BBL. OIL TANK STRUCK BY LIGHTNING, OLEAN, N.Y.



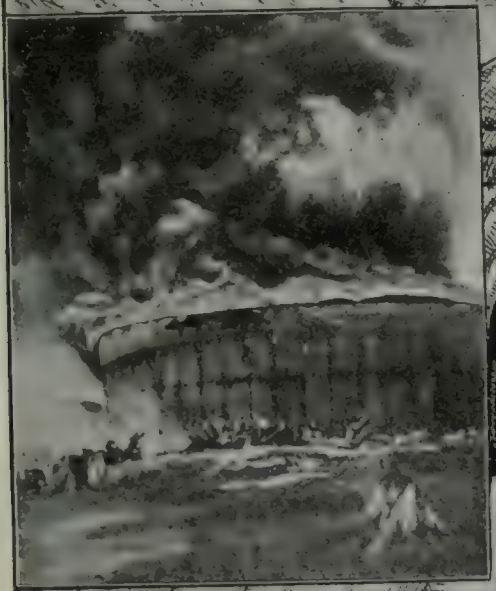
OIL WELL AND TANKS ON FIRE, BEAUMONT, TEX.



GREAT BURNING WELL, LOT 647
CHERRY GROVE PA.



SPINDLE TOP OIL FIELD FIRE, BEAUMONT, TEXAS.



35000 BBL OIL TANK
BURNING AT OLEAN, NY.



BURNING OIL TANKS.



GREAT BURNING OIL WELL.

(Lot 647.) Cherry Grove, Warren Co., Pa.



BURNING OIL WELL ON THE SAMUEL H. COOK LOT

(McDonald Oil Field). West Va. Natural Gas Co., Owners, McDonald, Pa.

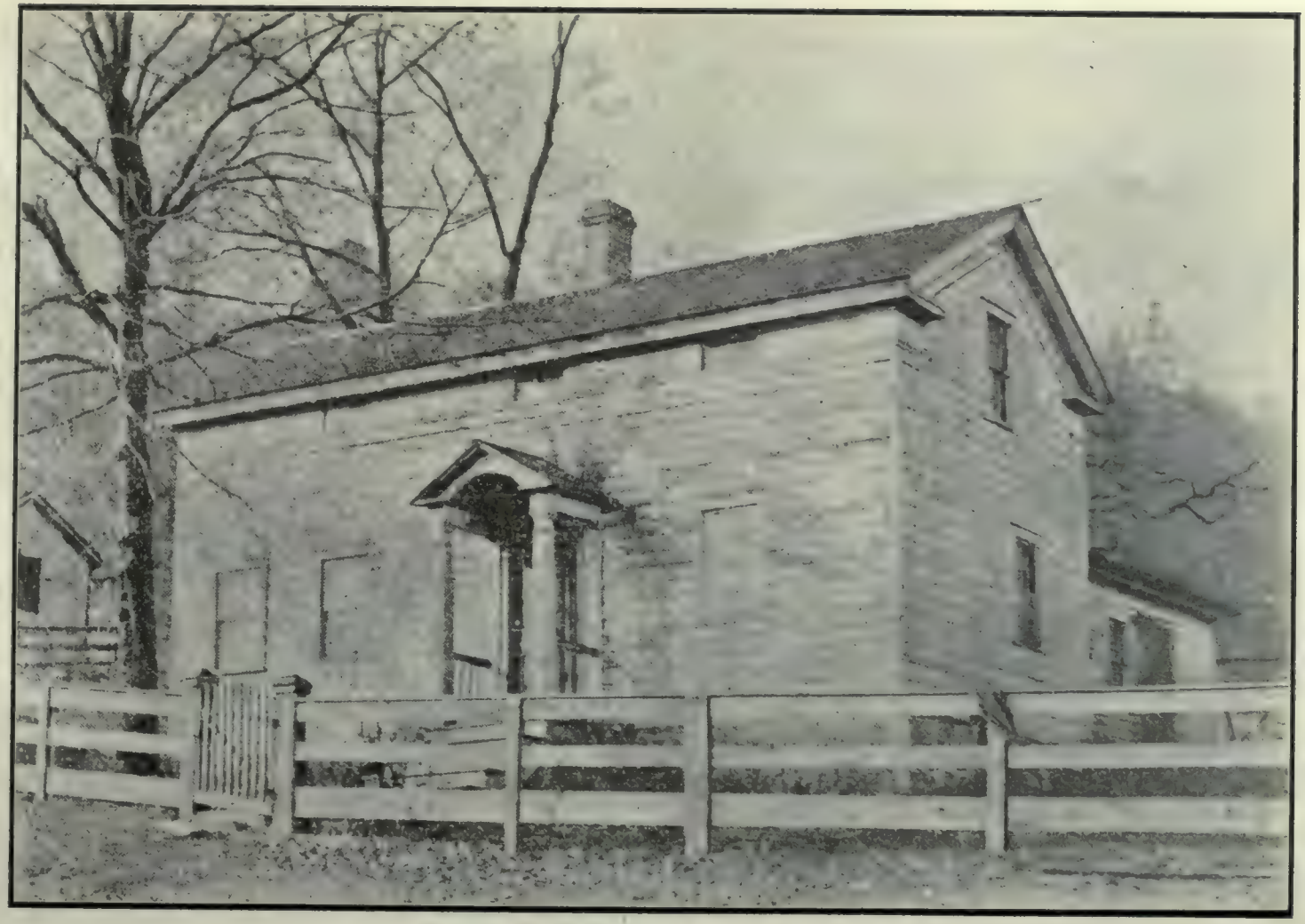


JOHN WASHINGTON STEELE (Coal Oil Johnnie)
At the Beginning of His Career in 1864.



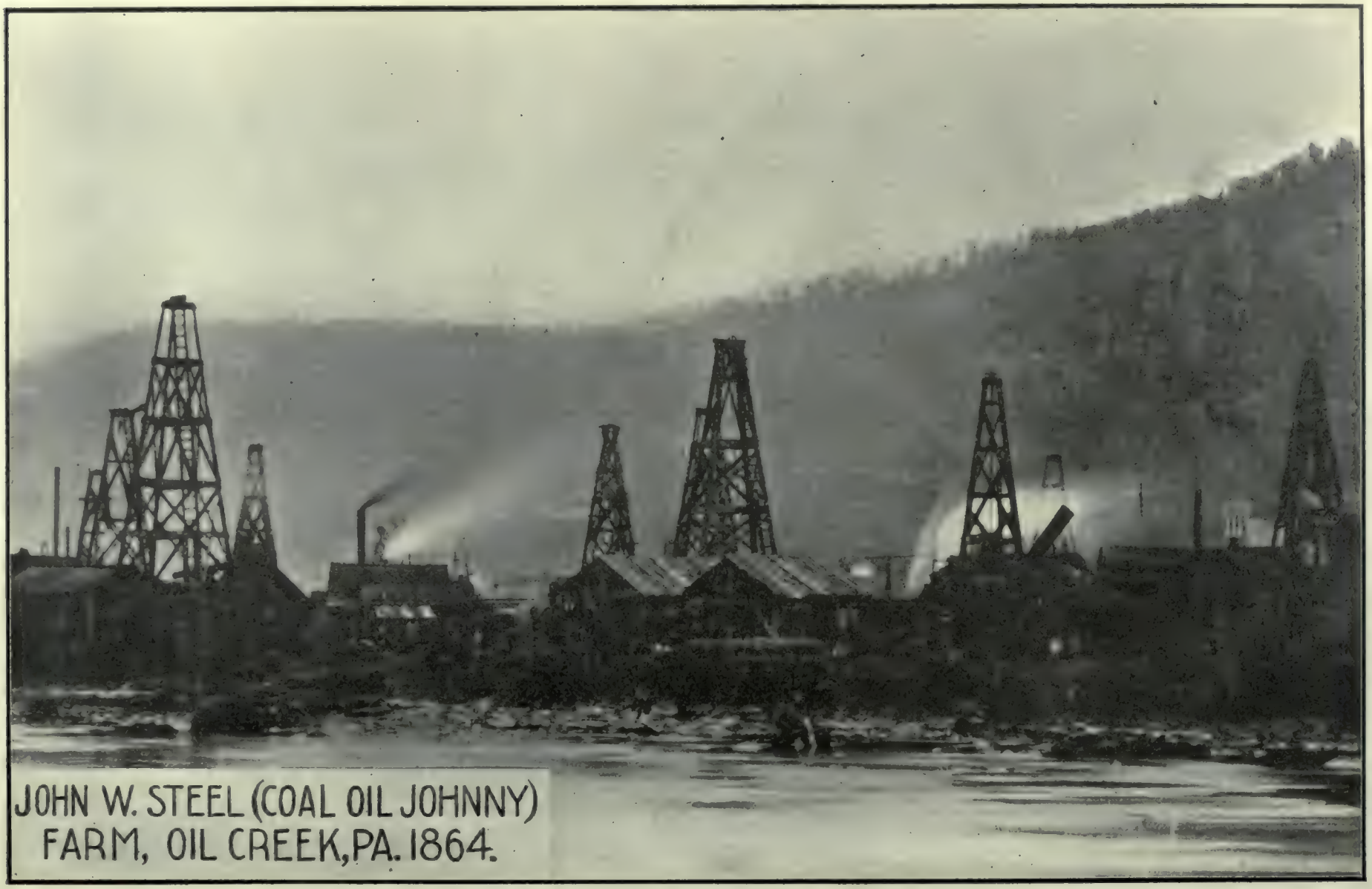
JOHN WASHINGTON STEELE (Coal Oil Johnnie)

As He Appears at the Present Day



CULBERTSON McCLINTOCK HOMESTEAD, OIL CREEK, PA.

WHERE JOHN W. STEELE (COAL OIL JOHNNY) WAS RAISED. OPPOSITE ROUSEVILLE, VENANGO CO., PENN'A.



JOHN W. STEEL (COAL OIL JOHNNY)
FARM, OIL CREEK, PA. 1864.



SHOOTING OIL WELL
WEST VIRGINIA OIL FIELD.



SHOOTING OIL WELL
WITH ONE HUNDRED QUARTS OF NITRO-GLYCERIN



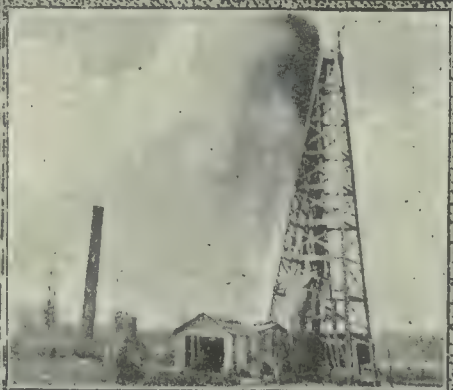
COL. E.A.L. ROBERTS.



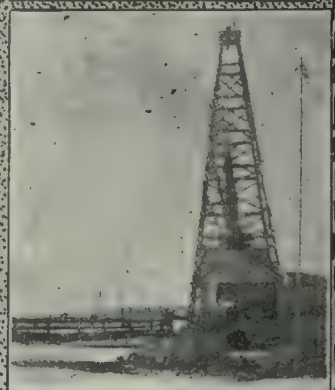
NITRO-GLYCERIN SHOOTERS AND OUTFITS, McDONALD, PA.



DR. W. B. ROBERTS.



FLOWING WELL AFTER SHOT.



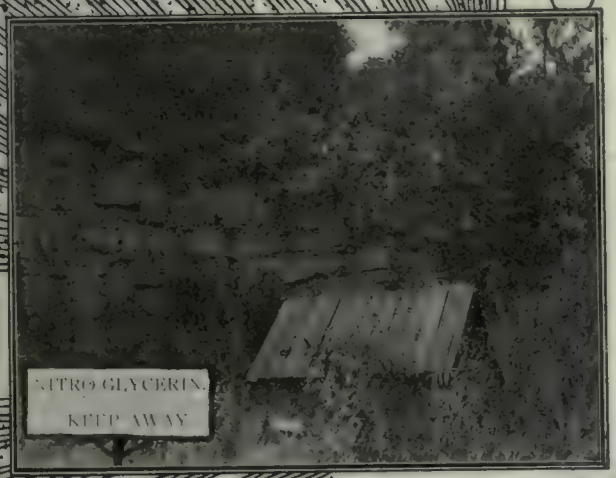
FLOWING WELL AFTER SHOT



THE FRENCH TORPEDO FACTORY
AT BELMONT WEST VA.



SHOOTING OIL WELL IN
THE McDONALD PA. OIL FIELD.



NITRO-GLYCERIN MAGAZINE IN THE STONE
QUARRY ON McDONALD FARM, McDONALD PA.



FILLING SHELL WITH NITRO-GLYCERIN
McDONALD PA OIL FIELD.



REMAINS OF A NITRO-GLYCERIN FACTORY
EXPLOSION AT ROUSEVILLE PA.



NITRO-GLYCERIN STOCK WAGON

CHARLES B. MATHEWS.

In relation to the affidavit of Charles B. Mathews, I need only appeal to the record, which is the only correct evidence as to the facts. Mathews appeared before a committee of congress in 1888 and swore as in his present affidavit to facts of which the record is the only correct evidence. The Standard Oil Company was not permitted by that committee to put witnesses on the stand to contradict Mathews as to specific statements, but was allowed to put their entire record in evidence. It did so, and it was published in the report of the committee. Those who read it will easily find that there was not in that case a particle of evidence against any member of the Standard Oil Company upon which any court could have held them, and the record, supplemented by the subsequent affidavits ofeseveral of the jurors, shows that the Everests were only convicted of enticing away a workman under contract, and that, too, a workman who had been seduced away from them and carried with him the secrets of the Everests' manufactory to incorporate into a rival manufactory.

JOHN D. ARCHBOLD.

State of New York,

City and County of New York, ss:

Before me, a notary public in the aforesaid state and city, personally appeared J. D. Archbold, who, being duly sworn, saith the facts above set forth are true to the best of his knowledge and belief. Sworn to and subscribed before me this 20th day of July, 1901. WALTER F. LIVINGSTON,

[SEAL] Notary Public.

Kings county certificate filed in New York county.

STATISTICS OF PETROLEUM PRODUCTION.

Presented to the Industrial Commission by W. B. Foster, Pittsburg, Pa.

Total production, in barrels of 42 gallons each, by years, from 1886 to 1900, both inclusive, of crude petroleum, known as "Lima oil," in the States of Indiana and northwestern Ohio, and aggregate sum realized for same at average price for each year.

Year	Production	Average price	Total Value
	Barrels.	*Cents.*	
1886	649,881	37½	$ 243,705.37
1887	5,152,709	15	772,906.35
1888	9,682,683	15	1,452,402.45
1889	12,186,564	15	1,827,989.60
1890	15,078,378	30	4,523,513.40
1891	17,452,612	30½	5,323,046.66
1892	15,867,575	36⅝	5,811,499.34
1893	15,982,097	47⅛	7,531,563.22
1894	17,296,510	48	8,202,324.80
1895	20,236,741	71¾	14,519,861.66
1896	25,255,870	66¾	16,858,293.22
1897	22,793,033	48	10,940,655.84
1898	17,128,897	61¾	10,577,093.87
1899	17,183,804	89⅞	15,442,943.84
1900	18,229,983	98½	17,956,533.25
Total	230,177,337	.....	$121,984,327.89

State of Pennsylvania, Allegheny county, ss:

W. B. Foster, being duly sworn, says that the foregoing statement being compiled by him from the most reliable statistics attainable, and is believed to be approximately correct. W. B. FOSTER.

Sworn and subscribed before me this 4th day of March, 1901. JAMES S. CAMPBELL,

[SEAL] Notary Public.

Total production, in barrels of 42 gallons each, by years, from 1859 to 1877, both inclusive, of crude petroleum, known as "Pennsylvania petroleum," in States of Pennsylvania, West Virginia, New York, and eastern Ohio, and agregate sum realized for same at average price for each year.

Year	Production	Average price	Total Value.
	Barrels.		
1859	8,500	$20.00	$ 170,000.00
1860	650,000	9.60	6,240,000.00
1861	2,118,000	.52	1,101,360.00
1862	3,056,000	1.05	3,208,800.00
1863	2,631,000	3.15	8,287,650.00
1864	2,116,200	8.15	17,247,030.00
1865	2,497,700	6.59	16,459,843.00
1866	3,597,500	3.75	13,490,625.00
1867	3,347,300	2.40	8,033,520.00
1868	3,715,800	3.62½	13,469,675.00
1869	4,215,000	5.60	23,604,000.00
1870	5,659,000	3.90	22,070,100.00
1871	5,795,000	4.40	25,498,000.00
1872	6,539,100	3.75	24,511,625.00
1873	9,893,786	1.80	17,808,814.80
1874	10,926,945	1.15	12,565,986.75
1875	11,987,514	1.24¾	14,954,423.71
1876	9,120,669	2.57⅝	23,497,123.51
1877	13,337,363	2.39⅜	31,926,312.68
Total	101,212,377	.....	$284,244,889.45

Despite the wholesale and almost interminable attacks upon the Standard Oil Company, however, the result of its great economy and superior efficiency in the oil industry have forced an unwilling public to admit its usefulness to the community. The fact that it has improved the quality and reduced the price of petroleum, without in any way inconveniencing the community, is no longer seriously challenged. Its motive is questioned, its great wealth is envied, its success is distrusted, but its economic superiority is no longer disputed, although the sensational magazines and journals have usually devoted themslves to denouncing the Standard Oil Company as a "monopoly" foreign to American principles. This is absurd in the extreme, for every penny's worth of stock is owned and held by American citizens. This can not truthfully be said of any other corporation of any importance in the United States. The United States Steel Company and the Pennsylvania Railroad Company, for instance, the stock of these two companies, as in a great number of other American corporations, is principally held by foreigners. This can not be said of the Standard Oil Company. One thing can truthfully be said of the

Standard Oil Company. Since it organized as a trust in 1882 that can not be said of any other person, company or corporation, and that is, it always has a market for merchantable crude oil, and at one time this company had 40,000,000 barrels of crude oil stored in iron tanks. This oil was the over production above the consumption. The oil so stored represented a value in oil and tankage of $52,000,000.

N. B.—The writer of this book on his last visit to the Bradford, Pa., oil field inquired of a number of pumpers who owned the wells and to whom did they sell their oil. One pumper said:

"We own the wells and we sell the oil to the Standard, but it fixes the price. It gives us what it's a mind to."

"But are you compelled to sell?"

"We have to sell or else keep the oil."

"How is it with your potatoes?" was asked. "Who fixes the price of them? Do the farmers? If so, why did you not raise the price last year, instead of letting your potatoes rot in the fields?"

"Oh, we could not sell them at any price," he replied.

"Is it ever that way with your oil?"

"No, you can always sell all you produce."

"Do you ever have to wait for your money?"

"No, you can get your money on the spot."

"So it does not matter how much oil you produce, you can sell it all, can you? and you never have to wait for your money? and never have any bad debts? Do you not wish it was that way with your potatoes and corn?"

"Well, it would have been better last year," was the reply.

After continuing the interview some time, the Bradford producer admitted that after all there were some advantages in having the Standard Oil Company as a customer. When asked what he thought would happen if the Standard was broken up and every oil producer had to market his own oil, the same as the farmer does his potatoes and other products, he shook his head and replied, "It would be pretty poor business for one-barrel well owners. It would not pay to run them." And then, as if conscious that he had made some concession, he exclaimed, "But it's a —— monopoly."

Another anti-trust "leaseholder," who was in the hardware business, when approached, voiced similar sentiments but he remarked, "It's a monopoly, but I wish I could sell my stoves the same way." He added, "I invest my money in hardware, supply the farmers with plows and stoves, wait six months for my money, and if the crops are poor, do not get it at all. With the oil you are sure of your sale, sure of your money, and do not have to wait a moment."

After getting the sentiments of various well owners, which were monotonously unanimous, I interviewed an energetic, intelligent newspaper man on the subject. He was more intelligent, better informed and had a broader conception of large capital and economic importance of the operation of large capital and concentration of productive machinery, and went so far as to admit that on the question of refining, The Standard Oil Company was a good thing, but it was the power of disaster to producers. In answer to questions, he admitted that the Standard furnished an unlimited market for all the oil the producers could supply, and guaranteed instant cash payment, and took all responsibility of transportation and all other expenses, after the oil reached the surface, and when asked why he was opposed to the Standard, he said: "We believe that if the refining business was in the unlimited market for all the oil the producers could get higher prices for our oil. They would bid against each other and we could hold back the oil till the price went up, but the Standard is the only purchaser and we have to take the price it offers or let the oil run on the ground."

"We believe" is truly the basis of the oil producer's thinking, but why they so believe seems not to occur to them to need explanation. Why they should expect that oil would go higher with a large number of small refiners as purchasers than with one large purchaser, none seemed to know. It does not seem to occur to them that if there was not a large company that would buy and sell the oil, they would have each to store it for himself as the farmer does for his corn, wheat and potatoes, and that there is nothing to prevent their doing so now. It does not occur to them either that if the market was made up of small purchasers, who would take only what they needed, as manufacturers do cotton and wool, leather and other products ,they would have on their hands all that is continually being held in storage by the Standard Oil Company, and as is often the case now with farm crops, they could not sell their whole output at any price.

The persistent ignoring of the advantages, and emphasizing the disadvantages of the Standard with relation to oil production exceeds anything to be found in any other line of business. When the facts, which they all admit, are fairly considered, the universal wail against the Standard more nearly resolves itself into pure economic prejudice than in any other case we ever knew. In fact, the oil producing industry is unique. With the exception of drilling the well and finding the oil, it affords an almost automatic income without much effort, responsibility or hardly any care. All an oil producer has to do is simply to furnish the well and the Standard Oil Company will do the rest. The Standard owns the pipe lines that pump the oil from the well to the refineries. When a producer drills a well and finds oil, all he has to do is to notify the Standard and it will lay the pipe line connecting it with his tank, bear all the expense of transportation and take all the product whether it needs it or not. The well owner simply has a tank into which he pumps his oil, and as fast as he pumps it, he can run it into the Standard pipe lines and draw his money. The Standard sustains about the same relation to the well owner that the government would to the silver mine owner under free coinage of silver, namely, take all the product, regardless of how much it is or whether it is needed, and pay "spot cash" for it. There is no other industry in the world where the producers have such absolutely unlimited market, such ease of sale and such complete guarantee against loss. No agents or drummers are needed; not even skill in bargaining is necessary. The most ignorant well owner can sell his product and get the market price for it as the most skillful operator. In fact, the Standard completely

protects them from all risks of ordinary commerce and assumes all the responsibility of the entire industry itself. Of course, some of the producers, strange to say, seem to be about as ignorant of the economics of the oil business as is an ordinary city merchant, imagining that they are robbed by the arbitrary fixing of the price of the oil; they insist that the price is fixed by the Standard at whatever point it pleases.

As a matter of fact, nothing of the kind occurs. If such were the case, it is needless to say that the Standard would put the price very much lower than it is, practically give nothing for the oil. Crude oil has been as high as six dollars a barrel. Since the Standard has been organized it has been nearly four dollars, frequently between two and three dollars a barrel. Why does the Standard give nearly three dollars a barrel at one time and less than seventy cents at another? Why does it not give seventy cents all the time? The simple answer is that it cannot get the supply at that price. Despite the Standard and all its monopolistic powers, the price of crude oil is governed by economic conditions over which neither the well owners nor the Standard have arbitrary control. Of course, the conditions are different from those in any other industry because the Standard Oil Company assumes a responsibility which is assumed by the purchasers of no other commodity. In no other industry is there either individual or collective interests which stand ready under all circumstances to take the entire product, regardless of the market demand. This the Standard Oil Company does, and when there is more than is needed, it stores it, and in doing so, it relieves the well owners of all contingent responsibility. If this were not done, the well owners would have to store it or sell at a sufficiently lower price, to pay some one else to store it. In that case the price would be governed by the cost of the dearest portion that the market, under those competitive conditions, would take, and when it was too much, some would remain unsold.

This competitive element being taken out of the market by the Standard Oil Company standing ready to take the entire product, causes the economic forces affecting prices to operate in a different way. Under the present arrangement, the Standard cannot refuse to buy when it does not need, hence, when the supply is greater than the demand and stock is being accumulated, the Standard materially lowers the price it will give; that is to say, it will still take all the product but at a lower price; and if the demand is pressing hard against the supply, it will pay a higher price so as to induce greater risk in drilling new wells to furnish an adequate supply. The Standard stands in relation to crude oil very much as the Bank of England does to gold. When it needs a greater supply of gold it raises the rate of discount; and when there is more than is needed, it lowers the rate of discount, but it always takes all that comes. It is thus easy to see that such an excess of supply would involve a great loss in storage, consequently the Standard offers a lower price.

This is not due to anything the Standard does or can do; it is due to the prolific output of the West Virginia oil fields. The new wells near Mannington, West Virginia, are each yielding from one hundred to six hundred barrels a day. Under the ordinary competitive conditions of purchase, only what is needed being taken and the dealers fixing the price, with this output, a very large number of single-barrel wells in Bradford would go out of use because the more prolific wells could supply the whole demand and could lower the price sufficiently to undersell the producers with the small wells. But as the Standard will take all that is produced, the single-barrel wells can sell their product the same as the six-hundred-barrel wells. In other words, the small producers cannot be crowded out by competition, so that in reality it is not the Standard that is now fixing the price of oil at one dollar and forty-two cents, but the prolific wells of West Virginia. Thus the law of cost of production operates, despite the seeming monopoly of the purchase, and operates the same on crude oil as on silver or wheat or any other product. From this there is no final escape, but the well owners in the Bradford oil fields imagine, that because oil was once three and four dollars a barrel and is now only one dollar and forty-two cents, that the Standard has arbitrarily reduced the price by that amount. They seem to know nothing of the economic effect of the West Virginia oil fields on the price of their product. Instead of the Standard being the enemy, consciously or otherwise, of the smaller well owners in the Bradford oil fields, it is in reality their best and almost only friend, for if the Standard were out of the way and free competitive conditions prevailed, many of the small well owners would be driven entirely from the field. For instance, if the one-barrel well owners had to furnish storage for their own product, transport it themselves and then run the risk of selling it in competition with owners of the more prolific wells, the cost of handling their small amount would be more than the price that they could get for it. It is only because the Standard furnishes all the storage and transportation and stands ready at all times to buy all the product that these small well owners can furnish, that they are able to stay in the field at all. As a matter of fact, they are a surplus quantity which competition would drive out; nothing but the economic paternalism of the Standard keeps them in existence. Yet curiously enough, it is the small well owners and not the large ones who think the Standard is robbing them.

It is not at all clear, however, that this is a good thing. It is quite certain that in the natural order of competitive evolution a large number of the small well owners would be rendered economically useless and be eliminated. They would be compelled either to move into the new fields and be a part of the live, active movement, or disappear, but for this somewhat abnormal method of the Standard in buying all the product, whether needed or not.

Under the present system of a guaranteed market for the whole product, oil production is reduced to an almost automatic process. The owner, for instance, of a one-barrel well is as completely assured of remaining in the market as the owner of a six-hundred barrel well. The one-barrel well will yield nearly five hundred dollars a year. This income being guaranteed by the Standard against all competition, the owner is relieved from all economic responsibility.

Whatever may be said against the Standard Oil Company, it cannot be charged with crowding out the small producers. On the contrary, it is the only power that perpetuates their existence. Were they exposed to the full force of competition, they would soon be annihilated or compelled to keep pace in the thrifty march of progress.

THE STANDARD OIL COMPANY OF NEW JERSEY.

Reorganized from the Standard Oil "trust," successors to the original Standard Oil Company. This company has the general directorship over the United Standard Oil and affiliated interests, and pays all the dividends to all the allied companies and its several branches.

John D. Rockefeller,, sr., president; John D. Archbold, chairman of the executive committee; vice presidents, William Rockefeller, John D. Archbold, Henry H. Rogers, Henry M. Flagler; William Rockefeller, treasurer; William P. Howe, secretary; Samuel C. T. Dodd, general solicitor; M. F. Elliott, attorney.

Directors: John D. Rockefeller, sr., Oliver H. Payne, William Rockefeller, W. H. Tilford, Henry M. Flagler, John D. Archbold, F. Q. Barstow, Benj. Brewster, O. B. Jennings, Henry H. Rogers.

Dividends paid by the Standard Oil Company:

	Per Cent.		Per Cent.
1882.....	5.25—100	1894.....	12
1883.....	6	1895.....	17
1884.....	6	1896.....	31
1885.....	10.50—100	1897.....	33
1886.....	10	1898.....	30
1887.....	10	1899.....	33
1888.....	11.50—100	1900.....	48
1889.....	12	1901.....	45
1890.....	12	1902.....	45
1891.....	12	1903.....	45
1892.....	12.21—100	1904.....	42
1893.....	12		

The Standard Oil Company is able to pay the large dividends owing to the fact that the 39,000,000 barrels of Pennsylvania oil it had stored in iron tanks has been reduced to a little over 4,000,000 in stock; the 35,000,000 barrels of oil has been refined and sold and converted into money; the same has been done with the over stock of Lima, Ohio, oil. Besides the daily runs, the best money maker for the Standard is its pipe lines, the refineries next, and the producing wells last.

THE STANDARD OIL COMPANY OF NEW YORK.

The general operating head of all the United Standard Oil companies.

This company regulates and makes the oil market of the world, produces and refines 90 per cent of all the oil produced in America, and has the general management over the several branches and allied companies united with the Standard Oil Company. Its officials are:

William Rockefeller, president; John D. Archbold, chairman of the executive committee; active vice presidents: John D. Archbold, Henry H. Rogers, Henry M. Flagler, William Rockefeller, treasurer; William P. Howe, secretary; Samuel C. T. Dodd, general solicitor; M. F. Elliott, attorney; L. D. Clarke, controller; A. H. Brainard, assistant controller; directors: John D. Rockefeller, sr, William Rockefeller, John D. Archbold, Henry H. Rogers, Henry M. Flagler, John D. Rockefeller, jr., F. Q. Barstow, Harry Payne Whitney, Oliver H. Payne, Harold L. Pratt.

Roster of the general and department officials of the Standard Oil Company, Standard Oil building, 26 Broadway, New York:

John D. Archbold, chairman of the executive committee.

Departments:

Crude oil department—P. S. Trainer, manager; W. L. Scryniser, assistant manager.

General sales department—Chas. P. Holdrege, manager.

Domestic trade department—William R. King, manager; E. C. Halsey, assistant manager.

Export sales department—F. D. Asche, manager.

Export trade committeemen—Livingston Roe, Wm. Donald and Walter M. McGee.

Foreign shipping department—Philip Ruprecht, manager.

Marine oil department—C. E. Bedford, manager.

Fuel oil department—C. W. Owston, manager; Henry Fisher, assistant manager.

Lighterage department—O. L. Holenbeck, manager; Geo. J. O'Brien, assistant manager.

Inspecting department—George M. Saybolt, manager.

Agents' department—R. P. Tinsley, manager.

Transfer department—Chas. T. White, manager.

Purchasing and supply department—T. H. Wheeler, manager.

Stationary department—E. B. Mead, manager.

Industrial exhibits department—O. T. Waring, manager.

Real estate and tax department—Theo. M. Towl, manager; C. P. Thurston, assistant manager.

Telegraph and telephone department—E. D. Arnold, manager.

Wick department—J. P. Haws, manager; Lou D. Sweet and L. P. Sheldon, committee.

Paint department—James G. Newcomb, manager.

Purchasing and crude oil department—P. S. Trainor, manager; W. L. Scryniser, assistant manager; E. T. Bedford, F. H. Bedford and Theo. Newman, committee.

Shipping and lighterage department—R. C. Veit, C. G. Little and O. L. Halenbeck, committee.

Legal department—Samuel C. T. Dodd, general solicitor; M. F. Elliott, attorney.

Auditor's department—Allen Wardwell, manager.

NATIONAL TRANSIT COMPANY.

Pipe Line Department.

Henry H. Rogers, president; Daniel O'Day, vice president; John Bushnell, controller; Geo. Chesebro, assistant controller; Geo. W. Colton, treasurer; W. A. Harris, assistant treasurer; F. M. Towl, general superintendent; D. S. Bushnell, assistant superintendent.

STANDARD OIL COMPANY OF NEW YORK.

Refining Departments.

Acme works—John D. Archbold, president. John D. Archbold, F. Q. Barstow and Fred Mohr, committee.

The General Manifold Oil Company—Chas. Miller, president.

Pratt Oil Works—Harold L. Pratt, manager; H. C. Folger, jr., assistant manager.

Eagle Oil Works—G. B. Gifford, manager; Wm. H. Erwin, assistant manager; H. A. McGee, T. J. Williams and J. H. Lecour, committee.

Bayonne refinery—James Smith, L. D. Morrison and J. P. Krebs, committee.

Bergenport Chemical works (Chas. Pratt & Co.)—Harold L. Pratt, manager; A. C. Bedford, assistant manager.

Union Tank Line Company department—H. R. Payne, secretary; Wm. M. Hutchinson, treasurer; Chas. M. Bloxham, master car builder.

The several departments have a committee meeting of their respective departments each and every forenoon on every business day through the whole year, when the oil trade is thoroughly gone over. The chairman of each department committee meets at 1 o'clock sharp each business day in the general committee room, fifteenth floor. This is known as the general executive committee, of the whole, of which John D. Archbold is the chairman. This committee investigates the supply and demand of the oil trade of the world, and upon the reports of the trade, demand and supply, the oil market of the world is made each day.

The Standard Oil Company controlls 75 per cent of the entire output of oil in the world, by outgeneraling the Russian, British, French, Austrian and Dutch oil companies in the oil markets of the world. The Standard Oil Company has over 100,000 employes on its regular payroll.

The Standard Oil Company have agencies in all parts of the world, and it is not out of place to say that the sun never sets on American produced oil and its by-products.

JOHN D. ROCKEFELLER.

John D. Rockefeller, president and founder of the Standard Oil Company, was born at Richford, Tioga county, New York, July 8, 1839. Owing to an affliction of the hair glands John D. Rockefeller, sr., is perfectly bald and beardless. John D. Rockefeller says the chief advantages of combination are:

1 Command of necessary capital.
2 Extension of limits of business.
3 Increase of number of persons interested in the business.
4 Economy in the business.
5 Improvements and economies which are derived from knowledge of many interested persons of wide experience.
6 Power to give the public improved products at less prices and still make a profit for the stockholders.
7 Permanent work and good wages for laborers.

The disadvantages or dangers to the public which may arise from combinations are stated by Mr. Rockefeller as follows: "That the power conferred by the combination may be abused; that combinations may be formed for speculation in stocks rather than for conducting business, and that for this purpose prices may be temporarily raised instead of lowered." But the possibility of abuse is no more an argument against combination than the fact that steam may explode is an argument against steam. The abuses can be minimized, Mr. Rockefeller believes, by proper legislation.

JOHN D. ARCHBOLD,

Chairman of the executive committee of the Standard Oil Company, was born in Leesburg, Carroll county, Ohio, July 26, 1848.

Standard Oil Company officials, their names and residence in the city of Greater New York for the year of 1904:

John D. Rockefeller, sr., president Oil Co., 26 Broadway. Residence, 4 West 54th St.

John D. Rockefeller, jr., Oil, 26 Broadway. Residence 13 West 54th St.

William Rockefeller, Oil, 26 Broadway, and treasurer 52 Broad St. Residence 689 Fifth and 54th St.

William G. Rockefeller, jr., residence 292 Madison avenue.

Henry M. Flagler, 26 Broadway, N. Y. Residence, Florida.

Henry H. Rogers, president, Oil, 26 Broadway. Residence 26 East 57th St.

John D. Archbold, vice president, Oil, 26 Broadway. Residence 20 East 37th St.

The late Charles M. Pratt, pres., 26 Broadway. Residence 241 Clinton avenue, Brooklyn.

The late Stevenson V. Harkness, Oil, 26 Broadway. Residence 685 Fifth avenue and 54th St.

Henry M. Tilford, merchant, 26 Broadway. Residence 24 West 52d St.

Wesley H. Tilford, pres., 26 Broadway. Residence 10 West 43d St.

Dan'l O'Day, vice pres., 26 Broadway and 39 Cortlandt St. Residence 128 West 72d St.

William T. Wardwell, Oil, 26 Broadway. Residence 21 West 58th St.

Oliver H. Payne, Oil, 26 Broadway. Residence 852 Fifth avenue.

Benj. Brewster, Oil, 26 Broadway. Residence 695 Fifth avenue.

Alfd J. Pouch (estate of), 68 Broad St.

Samuel F. Barger, Oil, 26 Broadway. Residence 192 Madison avenue.

Chas. W. Harkness, Oil, 26 Broadway. Residence 8 East 63d St.

Sam'l C. T. Dodd, lawyer, 26 Broadway. Residence 42 East 64th St.

William P. Howe, Oil, 26 Broadway. House 33 East 65th St.

Richard P. Tinsley, auditor, Oil, 26 Broadway. House, 36 Washington Square, West.

Silas H. Paine, Oil, 26 Broadway. Hotel Majestic.

Chas. M. Higgins, Oil, 26 Broadway. House 11 St. Nicholas Place.

Wade Hampton, Oil, auditor, 26 Broadway. House 278 Decatur, Brooklyn, N. Y.

John D. Rockefeller, sr., city residence No. 8 West 54th St., New York city. Country summer residence, Pocantico Hills, Bedford Roads, Tarrytown, New York. Cleveland city residence, Euclid and Case avenues and Prospect St. Forest Hill summer residence, 3220 to 3320 Euclid avenue, Cleveland, Ohio. Summer residence, Lakewood, New Jersey.

William Rockefeller, city residence, 689 Fifth avenue and East 54th St., New York city. Country summer residence, Broadway, Tarrytown, New York.

William Rockefeller's hunting lodge tract in Brandon township, five miles wide and 30 miles long, Adirondack mountains, New York. William Rockefeller, Waverly township tract, 20 by 30 miles, 42 sections. St. Regis river runs through center of tract; Northern Adirondack railroad runs through one end of tract. The tract contains six large fish ponds—Woll pond, Long pond, Whitley pond, Cranberry pond, Elbow pond, McDonald pond and Potter pond. The tract is known as Buck Mountains, North Hudson, Adirondack mountains, New York. William Rockefeller's Debar Mountain Park tract, five miles wide and six miles long, 16 sections, Duane township, Adirondack mountains, New York.

It is a well known fact that the wealth of the Standard Oil Company has increased so rapidly during the past five years that the chief problem of the all powerful contingent has been to find investments for its money, which it is unable to invest all of its income in the oil and natural gas business. The Standard has of late been purchasing large blocks of stock in the leading banks, railroads and insurance companies of America, and have directors in the following:

United States Steel—John D. Rockefeller, jr., H. H. Rogers.

Amalgamated Copper—H. H. Rogers, James Stillman, William Rockefeller, William G. Rockefeller.

Consolidated Gas—James Stillman, William Rockefeller.

New York Central—James Stillman, William Rockefeller.

Union Pacific—H. H. Rogers, James Stillman.

St. Paul—H. H. Rogers, William Rockefeller.

Missouri Pacific—John D. Rockefeller, jr.

Mutual Life Insurance Company—William Rockefeller, H. H. Rogers.

New York Life—James Stillman.

National City Bank—James Stillman, William Rockefeller.

Seaboard National Bank of New York—Daniel O'Day, Joseph Seep.

Wabash railroad—John D. Rockefeller, jr .

Delaware, Lackawanna and Western railroad—William Rockefeller, John D. Rockefeller, jr.

Baltimore and Ohio railroad system—H. H. Rogers.

Atchison, Topeka and Santa Fe railroad system—H. H. Rogers.

Pennsylvania railroad system—John D. Rockefeller, jr., James Stillman.

The two leading Standard Oil banks are the National City Bank of New York and the Seaboard National Bank of the City of New York.

The National City Bank of New York, one of the oldest, largest and most conservative banks in the country, was incorporated in 1812, with a capital of $800,000, which was increased in 1853 to $1,000,000. Its capital, surplus and undivided profits exceed $3,500,000, and its deposits ranged from $15,000,000 to $18,000,000 in 1892.

The bank is situated at 52 Wall street, where it has had its office since it first commenced business, the present building being the sceond one on the same iste occupied by it. The building which it first occupied had been previously used by the New York branch of the first Bank of the United States, the stock of the latter having been received in payment for subscriptions to the stock of the City Bank. The first president of the bank was Samuel Osgood, who had been naval officer of the port; and the first board of directors comprised Abraham Bloodgood, Ichabod Prall, William Irving, Samuel Tooker and William Cutting. G. B. Vroom was its first cashier. Moses Taylor became its president in 1856; and the energy, ability and integrity which long made him one of the foremost and most conspicuous merchants and business men of New York, characterized his administration of the bank and contributed largely to its increased prosperity. He died in 1882, and was succeeded in the presidency by his son-in-law, Percy R. Pyne, who resigend in 1891,

when James Stillman, of the well known firm of Woodward & Stillman, cotton merchants, was elected president.

Following is the statement of the condition of the National City Bank of New York September 9, 1903:

DEPOSITORY OF THE UNITED STATES,
THE STATE AND CITY OF NEW YORK.

NO. 1461.

THE NATIONAL CITY BANK

OF NEW YORK.

The Largest Bank in the United States, and is Known as the Standard Oil Bank.

ORIGINAL CHARTER DATED 1812.

CAPITAL FULLY PAID	$25,000,000.00
SHAREHOLDERS' LIABILITY	$25,000,000.00
SURPLUS AND UNDIVIDED PROFITS	$16,852,152.84

STATEMENT OF CONDITION

SEPTEMBER 9, 1903.

James Stillman, President.
Samuel Sloan, Vice President.
A. G. Loomis, Vice President.
G. S. Whitson, Vice President.
F. A. Vanderlip, Vice President.
William A. Simonson, Vice President.
Horace M. Kilborn, Cashier.
W. H. Tappan, Assistant Cashier.
A. Kavanagh, Assistant Cashier.
J. A. Stillman, Assistant Cashier.
S. E. Albeck, Assistant Cashier.
C. Janssen, Manager Foreign Department.

REPORT OF THE CONDITION OF

THE NATIONAL CITY BANK

OF NEW YORK,

At New York, in the State of New York, at the Close of Business, September 9, 1903.

RESOURCES.

Loans and Discounts		$105,715,763 45
Overdrafts, secured and unsecured		84 58
U. S. Bonds to secure circulation		5,520,000 00
U. S. Bonds to secure U. S. Deposits		12,937,000 00
U. S. Bonds on hand		76,090 00
United States Bond Account		4,250,000 00
Premiums on U. S. Bonds		922,888 86
Stocks, Securities, Etc.		17,544,436 88
Banking House, Furniture and Fixtures		200,000 00
Due from National Banks (not Reserve Agents)		3,969,859 53
Due from State Banks and Bankers		921,500 86
Checks and other Cash Items		471,125 61
Exchanges for Clearing House		12,147,419 37
Notes of other National Banks		851,575 00
Fractional Paper Currency, Nickels and Cents		844 03
Lawful Money Reserve in Bank, viz:		
Gold	$25,699,225 00	
Legal Tenders	6,052,861 00	31,752,086 00
Redemption Fund with U. S. Treasurer (5% of Circulation)		276,000 00
Total		$197,556,674 17

LIABILITIES.

Capital Stock		$ 25,000,000 00
Surplus and Undivided Profits (Net)		16,852,152 84
Tax Reserve		200,000 00
National Bank Notes Outstanding		5,447,950 00
Dividends Unpaid		599 00
Provident Reserve Fund	$ 30,000 00	
Individual Deposits subject to Check	85,223,222.56	
Demand Certificates of Deposit	127,564 50	
Certified Checks	4,393,811 02	
Cashier's Checks Outstanding	1,214,703 18	
	$90,989,301 26	
Due to other National Banks	$25,403,741 78	
Due to State Banks and Bankers	13,420,929 29	38,824,671 07
United States Deposits	12,937,000 00	142,750,972 33
United States Bond Account		7,305,000 00
Total		$197,556,674 17

State of New York, County of New York, ss:

I, Horace M. Kilborn, cashier of the above named bank, do solemnly swear that the above statement is true to the best of my knowledge and belief.

H. M. KILBORN, Cashier.

Correct—Attest:
JAMES STILLMAN,
STEPHEN S. PALMER,
GEORGE W. PERKINS, Directors.

Subscribed and sworn to before me, this 12th day of September, 1903. EDWIN F. COREY,
Notary Public, New York County.

DIRECTORS.

Francis M. Bacon, of Bacon & Co., 92 Franklin street;

Cleveland H. Dodge, of Phelps, Dodge & Co., 99 John street.

Charles S. Fairchild, president of the New York Security and Trust Company.

Henry C. Frick, president of the H. C. Frick Coke Company.

Edward H. Harriman, chairman Union Pacific Railroad Company.

Henry O. Havemeyer, president American Sugar Refining Co., 117 Wall street.

Archibald G. Loomis, vice president.

John A. McCall, president of the New York Life Insurance Company.

Cyrus H. McCormick, president McCormick Harvesting Machinery Company.

Edwin S. Marston, president Farmer's Loan and Trust Company.

Stephen S. Palmer, president New Jersey Zinc Co., 11 Broadway.

George W. Perkins, of J. P. Morgan & Co., 25 Wall street.

James H. Post, of B. H. Howell, Son & Co., 109 Wall street.

M. Taylor Pyne, 52 Wall street, New York.

William Rockefeller, of the Standard Oil Company.

John W. Sterling, of Shearman & Sterling, 46 Wall street.

Jacob H. Schiff, of Kuhn, Loeb & Co., 52 & 54 William street.

James Stillman, president.

William Douglas Sloane, of W. & J. Sloane, 884 Broadway.

Samuel Sloan, of the Delaware, Lackawanna and Western Railroad Company.

Henry A. C. Taylor, 52 Wall street, New York.

Moses Taylor, vice president Lackawanna Iron and Steel Company.

P. A. Valentine, of Armour & Co.

The Seaboard National Bank of the City of New York, located at 18 Broadway, adjoining the Standard Oil building. This bank was organized in 1880 and from its organization it has steadily risen to the highest position among the banks of that city, in the extent of is business, and the sound, yet enterprising character of its management; and it has passed, in volume of business and deposits, some 50 banks of that city, which were well established before this bank was organized. During the panics of 1884 and 1890 this bank relied entirely upon its own resources, not accepting the assistance of the New York clearing house association, which was offered to all banks that were members of the association, and was freely used by many of the strongest. It has been the practice of the bank never to charge its depositors more than the legal rate of interest, no matter what the ruling rate in the market, so that in a time of stringency in the money market its depositors have had every assistance which the bank was able to extend, which fact has been greatly appreciated by them, as shown by the steady increase of its deposits, which, during the last five years, have increased at the rate of one million dollars per annum. The bank is also represented in the management of the New York Clearing House Association, one of its officers being a member of one of the most important committees, necessitating the examination of all banks applying for membership to the association. The varied interests of its depositors are duly represented in its board of directors and contribute to its business, which covers all departments of trade. The bank has an extended connection with, any line of deposits from, leading bankers in other cities, a large corporation custom, and many accounts among large mercantile firms and individuals. It is also a depository for the United States, the state of New York, and the city of New York, and is officially designated for the same purpose by the Produce, Cotton and Coffee exchanges of New York. Promptness, accuracy and a spirit to accommodate its depositors, of whatever class, is the rule of the management; and this to a large extent explains its remarkable progress.

THE SEABOARD NATIONAL BANK

OF THE CITY OF NEW YORK.

The Standard Oil Company's General Bank and Clearing House.

S. G. Bayne, President.
S. G. Nelson, Vice President,
C. C. Thompson, Cashier.
W. K. Cleverley, Assistant Cashier.
J. H. Davis, Assistant Cashier.

DIRECTORS.

Samuel G. Bayne, President.

Edward C. Bodman, of Milmine, Bodman & Co., produce commission merchants, 6 Broadway.

T. Wister Brown, vice president Provident Life and Trust Company, Philadelphia.

Lucius A. Cole, president National Lead Company, 100 William street.

General Francis V. Green.

Stuart G. Nelson, Vice President.

Daniel O'Day, of Standard Oil Company.

Franklin Quinby, of Rice, Quinby & Bro., merchants, 11 South William street.

Joseph Seep, of Standard Oil Company.

Charles C. Thompson, Cashier.

THE SEABOARD NATIONAL BANK

OF THE CITY OF NEW YORK.

STATEMENT, SEPTEMBER 9, 1903.

RESOURCES.

Demand loans	$ 6,601,402.36
Discounts and time loans	4,568,471.01
Overdrafts	24.31
United States bonds	263,500.00
Due from banks	1,256,011.01

RESERVE.

Cash, exchanges and due from U. S. treasurer	5,827,264.02
	$18,516,672.71

LIABILITIES.

Capital stock	$ 500,000.00
Surplus and profits	1,338,753.44
Circulation	50,000.00
Reserve for taxes	9,000,00
Dividends unpaid	18.00

DEPOSITS.

Individuals	$5,807,787.30	
Banks	10,610,113.97	
U. S. deposits	201,000.00	
		16,618,901.27
		$18,516,672.71

I, Charles C. Thompson, cashier of the above named bank, do solemnly swear that the above statement is true to the best of my knowledge and belief.

CHARLES C. THOMPSON, Cashier.

Attest:

DANIEL O'DAY,

JOSEPH SEEP,

FRANKLIN QUINBY, Directors.

Subscribed and sworn before me September 11, 1903. CHAS. C. FISHER, Notary Public.

Depository of the United States, state of New York and city of New York.

HISTORY OF PURE OIL COMPANY.

(INDEPENDENT.)

(Not interested with Standard Oil Company.)

Incorporation Office, Jersey City, New Jersey; General Office, Manhattan Building, Philadelphia, Pa.

Pure Oil Company, producers and refiners of petroleum, crude oil and by-products. Organized November 6, 1895; incorporated under the laws of the state of New Jersey, May 1, 1897; capital stock, $1,000,000.

Incorporators: David Kirk, Jerome B. Akin, Marcus L. Lockwood, Walter A. Dennison, C. H. Duncan, Theodore B. Westagte, James W. Lee, Adolphus A. Hoch, Ferd Reiber, Louis Walz, Rufus Scott, Lewis Emery, jr., M. Murphy, H. King, W. L. Curtis, Thomas W. Phillips, Clarence Walker.

Officials at time of organization: David Kirk, president; Clarence Walker, secretary; C. H. Duncan, treasurer.

Present board of officials: Michael Murphy, president; James W. Lee, vice president; W. S. Weber, secretary; W. W. Tarbell, treasurer.

PURE OIL COMPANY AGREEMENT.

Trust Agreement and By-Laws and Rules and Regulations of the Pure Oil Trust.

THE TRUST AGREEMENT IN FULL.

This agreement, made and entered into by the Pure Oil Company, a corporation organized and existing under the laws of the state of New Jersey; David Kirk, Jerome B. Akin, Marcus L. Lockwood, Walter A. Dennison, Charles H. Duncan, Theodore B. Westgate, Wm. L. Curtis, James W. Lee and David Kirk, trustees for the McCalmont Oil Company, severally subscribers to and owners of the capital stock of the said Pure Oil Company, and Thomas W. Phillips, Lewis Emery, jr., Rufus Scott, Clarence Walker, Louis Walz, James W. Lee, David Kirk, Marcus L. Lockwood, Jerome B. Akin, Charles H. Duncan, Hugh King, Michael Murphy, Adolphus A. Hoch, Ferdinand Reiber and Walter A. Dennison, parties mutually agreed upon to exercise the trusts created hereunder.

Witnesseth, That whereas the Pure Oil Company is formed for the purpose of engaging in directly and of aiding other companies and parties engaged in the production, transportation, storage, manufacture and sale of crude petroleum and its products, and in any business incident thereto, and it is desired to enlist therein the co-operation of other parties, and to procure capital to be invested in the shares of its capital stock, and in such other ways as may be desirable, which investments are to be solicited from parties not now interested in the company; and

Whereas, it is advisable, equitable, essential and intended for their safety and advantage of all interests that the control of the said Pure Oil Company shall be secured permanently, as to prevent and render impossible at all times the diversion of its resources and business, and to permanently protect and maintain what are known as the "independent interests" in the petroleum industry, and to maintain the policy agreed on for conducting the business of the company in the interest and for the protection of all rights in the company, created by mutual agreement of shareholders, or by operation of law; therefore the said parties hereto, in consideartion of the sum of one dollar by each to the other paid, the receipt of which is hereby acknowledged by each, and in further consideration of the mutual benefits received, to be received, or expected from the agreements, covenants and trusts hereinafter contained, and from the undertakings and business to be promoted, do hereby agree and consent to the various acts and things hereinafter set forth; provided, however, that no party hereto shall be bound to do any act or thing, or be responsible for the results or consequences of any act or thing done or omitted to be done, except so far as relates to such act or thing as he himself expressly undertakes to do and perform; and do further agree as follows:

First. The capital stock of the Pure Oil Company, as authorized in its certificate of organization, is to be one million ($1,000,000) dollars, represented by two hundred thousand (200,000) shares, of the legal par value of five ($5.00) dollars each, divided into classes

and to be issued, held and transferred subject and according to law and the by-laws, rules and regulations adopted and approved by all the shareholders of the company, a copy of which is hereto attached and referred to.

Second. The said David Kirk, Jerome B. Akin, Marcus L. Lockwood, Walter A. Dennison, Chas. H. Duncan, Theodore B. Westgate, William L. Curtis, James W. Lee and David Kirk, trustee of the McCalmont Oil Company, are the owners of all the shares of the capital stock now subscribed, amounting to three thousand (3,000) shares, of which they hereby transfer to the said Thomas W. Phillips, Lewis Emery, jr., Rufus Scott, Clarence Walker, Louis Walz, James W. Lee, David Kirk, Marcus L. Lockwood, Jerome B. Akin, Charles H. Duncan, Hugh King, Michael Murphy, Adolphus A. Hoch, Ferdinand Reiber and Walter A. Dennison sixteen hundred (1,600) shares, being more than a majority of the shares of the company now subscribed, and agree that one-half of all the shares hereafter subscribed and issued shall be transferred in like manner to the said parties and their associate trustees, as may be appointed, to be by them held in trust for the uses and purposes herein proposed, and subject to the terms and conditions as follows:

First. The equitable ownership of the trust shares and all interests therein shall be subject to the terms of this trust agreement; such ownership of the shares or interests therein may be sold at the will of the holder, but no sale, transfer or conveyance of such ownership or interests shall give to the purchaser any right other than are provided for in the by-laws, rules and regulations of the company and in accordance with this trust the trustees hereunder shall at all times be recognized as the legal owners and holders of the trust shares to carry into effect the purposes of this trust, and all equitable owners of trust shares or interests therein shall specifically agree in writing to the terms of this trust, and no transfer of any such shares or interests shall be made, or be effective if made until the transferee of such equitable ownership or interest shall have agreed in writing to receive and hold the same subject to the provisions of this trust.

Second. At all meetings of the company for the election of directors, or for any other purpose, to cast the entire number of votes which, as holders of said shares, they would be entitled to cast.

Third. Each trustee at such meetings shall be entitled to cast an equal number of all the votes which all of the trustees would be entitled to cast in the aggregate, if present, except as hereinafter provided.

Fourth. In case of differences of opinion among the trustees present at any such meetings as to how such votes shall be cast in regard to any matter or thing to be voted on, they shall be cast as the representatives of four-fifths of all the shares held under this trust may direct in writing, if so demanded in writing by any of the trustees.

Fifth. Any trustee unable to attend any meeting of shareholders, and to personally cast the votes he would be entitled to cast if present, may authorize any other trustee to cast the vote which he would be entitled to cast if personally present, which authority shall be in writing, approved by three-fifths of the trustees other than himself.

Sixth. When none of the trustees can be present at any meeting of the stockholders, legally held, they may be represented by proxy by an attorney appointed in writing, executed by three-fifths of the trustees.

Seventh. The trustees may execute such consents in writing as in their opinion it may be right and proper for them to do in the interests of the Pure Oil Company and of the owners of the shares held by them in trust, provided that no such consents shall be executed against the objection of the equitable owner of 10 per cent of the shares held by them in trust, unless after the question of executing such consent shall have been submitted in person or by writing, properly addressed to the several equitable owners of the shares held in trust, and approved in writing by such owners of three-fifths of such shares.

Eighth. The number of trustees may be increased or diminished at any time; or any trustee may be removed, without assignment of cause or reason therefor, by three-fifths of the trustees and the written consent of the equitable owners of three-fifths of the shares held in trust hereunder; and upon such removal, or on filing of such written consent with the secretary of the company and on notice in writing delivered to the party so removed, or sent by registered letter to his proper address, the rights, duties and obligations of such party as trustee shall immediately cease.

Ninth. In case of death, resignation or removal of any of the trustees the trust shall be exercised by the remaining trustees until the vacancy be filled by the appointment of new trustees for that purpose, on the nomination of the equitable owners of a majority of the shares previously represented by the trustees, whose place is vacated with the consent in writing of the equitable owners of three-fifths of the shares held under this trust and the approval of the three-fifths of the trustees.

Tenth. No trustee has any beneficial interest in this trust, personally, as to entitle him to maintain any action at law or in equity to enjoin, delay, hinder or prevent his removal from the trusteeship, or to recover any damages on account thereof from the company or the trustees, or from the individual stockholders by whose action he may have been removed.

Eleventh. The trustees shall appoint a chairman and secretary, and shall keep regular accounts showing the ownership and residence of the various equitable owners of the shares held by them in trust, and shall execute and deliver to such several owners certificates in due form, approved by the directors of the company, evidencing the number of shares held by them in trust for each of such several owners, and shall make such transfers of any of the shares as they may be requested to do by such several owners on the surrender of such certificates representing such shares, properly endorsed, assigned for transfer subject to the terms of this permanent trust, any of the shares thereby represented in the manner prescribed for making such transfer.

Twelfth. The trustees shall immediately advise the company, by writing, addressed to the secretary, of any

transfer of ownership of any of the shares held by them and shall, on written request of the treasurer of the company, certify to him the names and residence of all equitable owners of shares held by them in trust; and shall sign warrants for the payment to such owners, severally, of any dividends to which they may be entitled on the share so held in trust.

Thirteenth. This agreement may be changed at any time only with the consent in writing of the Pure Oil Company, three-fifths of the persons at the time acting as trustees hereunder, and of the equitable owners of three-fifths of the shares held in trust thereunder.

Fourteenth. This agreement may be cancelled, and the trust hereby created dissolved, only by the winding up of the Pure Oil Company, or by the consent in writing, duly executed, of the equitable owners of four-fifths of the shares held intrust hereunder, and of four-fifths of all the other shares of the company, after providing in full for the redemption or purchase, at one hundred and ten dollars per share, in cash, of all the preferred and common shares of the company at the time outstanding.

Fifteenth. The said Thomas W. Phillips, Lewis Emery, Jr., Rufus Scott, Clarence Walker, Louis Walz, James W. Lee, David Kirk, Marcus L. Lockwood, Jerome B. Akin, Charles H. Duncan, Hugh King, Michael Murphy, Adolphus A. Hoch, Ferdinand Reiber and Walter A. Dennison hereby accept the trust herein conferred and imposed upon them.

In witness whereof the parties hereto have severally signed this agreement as of the 6th day of November, A. D. one thousand eight hundred and ninety-five.

PURE OIL COMPANY.
DAVID KIRK, *President.*
C. H. DUNCAN, *Treasurer.*

Incorporators: David Kirk, Jerome B. Akin, Marcus L. Lockwood, Walter A. Dennison, C. H. Duncan, Theodore B. Westgate, James W. Lee, David Kirk, trustee for McCalmont Oil Co., W. L. Curtis, Thomas W. Phillips, David Kirk, Marcus L. Lockwood, Clarence Walker, James W. Lee.

Trustees: Walter A. Dennison, Jerome B. Akin, C. H. Duncan, Adolphus A. Hoch, Ferd. Reiber, Louis Walz, Rufus Scott, Lewis Emery, Jr., M. Murphy, H. King.

BY-LAWS AND RULES AND REGULATIONS OF THE PURE OIL TRUST.

[Incorporated November 8, 1895. Capital $1,000,000.]

The objects of the company are to produce, purchase, transport, store, and sell crude petroleum and its products and to protect and to aid other companies and parties in the production, transportation, manufacture, storage, and sale of the same. The corporation may acquire, hold, maintain, and dispose of any stocks, shares, bonds, and other interests in or issued by the corporation, joint-stock, or limited-partnership association engaged in or aiding or promoting the producing, transporting, storing, refining and selling of crude petroleum or its products, or in any business incident thereto.

BY-LAWS.

ARTICLE I.

Meetings of Shareholders.

Section 1. The annual meeting of the shareholders shall be held at the principal office of the company on the fourth Wednesday of January in each year, commencing at 10 o'clock a. m. standard time.

Notice of the annual meeting of shareholders shall be by written or printed letter addressed by the secretary to each shareholder at his or her last known place of residence, and mailed ten days prior to the time fixed for holding such annual meeting.

Section 2. Special meetings of shareholders may be called whenever it shall be deemed advisable by the board of directors, or by the president upon request in writing signed by the shareholders owning collectively not less than one-third of the shares of the company.

Notice of special meetings shall be given in the same way as the notices of annual meetings.

Proxies.

Section 3. Shareholders may be represented at any meeting of the shareholders by proxy, duly authorized in writing, executed within thirty days next preceding the meeting.

Quorum.

Section 4. The legal representatives of a majority of all the shares of the company shall constitute a quorum at any meeting of the shareholders; and without a quorum being present or represented by proxy no business shall be transacted or election held, but a less number may adjourn from time to time until a quorum be present.

Voting.

Section 5. At meetings of shareholders, general or special, all votes upon disputed questions shall be by ballot, if demanded by any shareholder present, and all votes by ballot shall be determined by the number of shares represented by the respective votes cast.

At all meetings of shareholders for the election of directors, each shareholder shall be entitled to cast as many votes as he has shares of the company standing to his name on the books of the company.

The election shall be by ballot, and each ballot shall have endorsed thereon the name of the person casting same and the number of shares prescribed thereby.

Vacancies.

Section 6. In case of death, resignation, or removal

of any director, the vacancy shall be filled by the remaining directors.

Tellers.

Section 7. The directors shall appoint two shareholders as tellers to conduct the election and to certify the results in writing to the parties elected and to the president and secretary of the company. In case of the directors failing to so appoint, the shareholders present shall choose two tellers to conduct the election.

The secretary of the company shall furnish the tellers, for their guidance in conducting the election, a list of shareholders, showing the number of shares standing in the name of each on the books of the company, authenticated by the seal of the company

Time of Election and Term of Office.

Section 8. The polls shall be open from two to three o'clock p. m. The terms of office of directors shall commence at noon on the first Wednesday after their election at the annual meeting of stockholders and continue until their successors are duly elected and seated.

ARTICLE II.

Directors—Meetings.

Section 1. The board of directors shall fix the time and place for holding its meetings.

Special meetings of the board may be held at any time on the call of the president or any two directors, after due notice is given to each of the directors.

Election of Officers.

Section 2. At the first meeting after their election the directors shall organize by electing from their number a president and vice president to serve until their successors are qualified, and appointing a secretary and a treasurer to serve during the pleasure of the board.

Quorum.

Section 3. A majority of the directors shall constitute a quorum at any meeting of the board, and no business shall be transacted by the board without a quorum being present.

Salaries.

Section 4. The salary of the president and vice president shall be fixed by vote of the stockholders.

Executive Committee.

Section 5. For the more prompt and efficient management of the affairs of the company there shall be an executive committee of the board, consisting of the president, vice president, and three other directors, who shall be appointed by and hold office during the pleasure of the board. In the intervals between the meetings of the board of directors its powers and duties shall devolve upon and be exercised by the executive committee, subject to the approval of the board at its next regular meeting.

The proceedings of the executive committee shall be duly recorded in the same manner as the regular proceedings of the board of directors.

A majority of the executive committee shall constitute a quorum.

In case of disagreement of the executive committee on any subject, the matter shall be referred to the board of directors.

Minutes.

Section 6. The board of directors shall cause to be kept a complete record of their official proceedings and acts of the proceedings of all shareholders' meetings; present to the shareholders at the annual meeting a statement of the assets and liabilities of the company and of the condition of its affairs generally.

ARTICLE III.

Powers and Duties of Officers—President.

Section 1. It shall be the duty of the president to preside at all meetings of the board of directors, to sign all certificates of stock and warrants for the payment of money ordered by the board of directors, and such other papers as he may be ordered by the board of directors to execute on behalf of the company.

In case of the absence or inability of the president to act, the vice president shall be invested with all the powers and perform all the duties of president. In case of absence or inability to act of both president and vice president, the board of managers may appoint one of their number president pro tem., who shall during such absence or inability perform all the duties of president.

Secretary.

Section 2. The secretary shall keep the minutes of the meetings of the board of directors in a proper book provided for that purpose; attend to the giving and publication of all notices of the company, unless otherwise provided for by the board of directors; have the custody of the seal of the company and affix same to all certificates of stock and such other papers as the directors may order; countersign all warrants on the treasury for the payment of money, which shall have been previously signed by the president as authorized by the board of directors; attend to such correspondence as shall be assigned to him; act as secretary of all standing committees of the board, and shall in general, under the direction of the board of directors, perform all the duties incident to the office of secretary of the company.

Treasurer.

Section 3. It shall be the duty of the treasurer of the company to receive and deposit or hold and pay,

as the board of directors may order, all funds resulting from the sale of shares or any property of the company; and shall sign all stock certificates and obligations of the company created by special order of the board of directors.

The treasurer shall give bond for the faithful discharge of his duties in such amount and with such security as the directors may determine.

Rules and Regulations.

1. The business of the company shall be the producing, purchasing, transporting, storing, and selling of crude petroleum and its products, and aiding other companies and parties in the production, transportation, storage, manufacturing, and sale of the same. The corporation may acquire, hold, manage, and dispose of any stocks, shares, bonds, and other interests in or issued by any corporation, joint stock company, or limited partnership association engaged in, or aiding, or promoting the producing, transporting, storing, refining, and selling of crude petroleum or its products, or in any business incident thereto. And in addition to the powers hereinbefore provided for, it may also purchase, hold, manage, and sell on commission, or otherwise, such investment securities and other property, real, personal, and mixed, as the corporation may be generally or specifically authorized in writing from time to time, by the owners and holders of a majority in number of the shares of the capital stock of the company, to purchase, hold, and sell.

And the company may exercise such trusts and do such other things, not inconsistent with its charter, as it may from time to time be authorized in like manner to do.

2. The principal office of the company shall be located at Jersey City, in the county of Hudson and State of New Jersey, and branch offices may be established from time to time as may be determined by the consent of the owners and holders of three-fifths of the shares of the company.

3. The shareholders shall make rules and regulations and by-laws for the government of the company and the management of its business and affairs as in their discretion they may deem advisable, which may be amended at any time by the consent of the owners and holders of three-fifths in number of the shares of the company, given in writing, filed with the secretary, and recorded in the minutes of the proceedings, both of the shareholders and directors of the company.

4. The affairs of the company shall be managed by a board of directors, consisting of nine members, to be elected annually by the shareholders at their annual meeting, at which each shareholder shall be entitled to cast, personally or by proxy, one vote for each share of stock in the company held by such shareholder. The directors shall choose annually from their own number a president and vice president to serve until their successors are chosen; shall appoint all other officers, managers, agents, or employes of the company; prescribe the duties and fix the compensation of each; and may suspend or remove any of them at discretion, and they may make such additional by-laws as may be deemed by them advisable—all subject to the by-laws and rules and regulations adopted by the shareholders for the governing of the company.

5. Interests of the company will be represented by shares which may be divided into classes, including preferred, common, and deferred shares, to be issued, held, and transferred, subject to the by-laws and regulations of the company.

The preferred and deferred shares may be each subdivided into various classes, each class having such special rights and limitations as will more particularly adapt them too the uses for which they are intended, subject to such relation to the shares of other classes as may be established in their issue.

The rules and regulations relating to them will embrace the following features:

6. A majority of all the shares of the company shall be held in a permanent trust approved by all the shareholders, to secure the control of the company and the faithful maintenance of the policy agreed on for conducting the business of the company in the interest and for the protection of all concerned in its affairs. The shares so held shall be designated as trust shares.

7. The capital of the company shall be the net amount of cash paid into the treasury of the company for its permanent use as the proceeds of its stock issued and sold for cash for account of capital; and no credit in excess of the amount shall be made to "capital" in accounts or statements of the company.

8. No preferred stock shall be issued except as cash to the extent of one hundred dollars for each share of such stock issued shall be paid into the treasury of the company to the credit of capital, or of surplus, or of the guaranty and redemption fund, to be created as prescribed in section 12 hereof, as may be deemed advisable.

Any of the preferred shares may be converted, at the option of the holder, into common or deferred shares by so stipulating in their issue and distinctly stating the right of conversion in the certificates representing them; otherwise they shall not be convertible.

9. The deferred shares of the company may be issued for cash, investment securities, property, services, payment of expenses, making disbursements of any kind, and in exchange for shares of other classes issued by the company at the discretion of the directors, with the written consent of the owners of a majority of the shares of the company at the time outstanding.

10. The holders of preferred stock shall be entitled to receive cumulative dividends thereon of one dollar and a half per share quarterly, in full, before any dividend shall be payable on the common stock.

11. A guaranty and redemption fund shall be created and maintained by crediting thereto all of the cash received by the company from the following sources:

(a) The proceeds of all shares of the company sold for cash by the company when issued, in excess of the amount credited to capital.

(b) The cash proceeds of all shares, securities, or other property of whatever kind acquired by the company in exchange for its shares of any class, as such proceeds may be realized, at any time, by the sale for cash of any portion of such shares, securities, or property.

(c) The proceeds of all shares, of whatever class, purchased by the application of the guaranty and redemption fund, as authorized, and resold for cash by the company.

12. The guaranty and redemption fund shall be applicable to the general uses of the company, but may be applied to buying of shares of all classes, in the order of their priority or right to dividend, as stipulated, at the lowest rates at which any shares of the same class can be bought, not over one hundred and ten dollars per share, on demand of the several owners and holders of shares, respectively made within a prescribed time after the payment of dividends; provided, notice of the intention to make such demand shall have been given to the secretary of the company thirty days before the time fixed for the declaration of dividends; and provided further, that no part of the guaranty and redemption fund shall be applied to buying, at any price, the shares of any class, so long as there may remain unsatisfied any demand made by the owners and holders of the shares of any prior class to have the same redeemed at not over one hundred and ten dollars per share.

All shares so purchased shall be placed in the treasury, to be used for the benefit of the company in such form and manner as may be determined by the directors, with the consent, in writing, of the owners and holders of a majority of the shares of the company.

13. When no shares of any class can be purchased at one hundred and ten dollars per share, the guaranty and redemption fund shall be applicable, at the discretion of the directors, to the purchase of the shares of the several classes, other than the trust shares, at such rates above one hundred and ten dollars per share as may be approved by the owners of a majority of the shares of the capital stock.

The shares of any class so purchased may, when authorized by the owners of a majority of all the shares of the company, be resold at any time, at the discretion of the directors, at any price not less than that at which they were severally purchased; or they may be retired from the classes to which they belong, and be placed in the treasury of the company, to be held, reissued and sold for its use and benefit, subject to such conditions as the directors may prescribe, in accordance with the regulations of the company.

14. When the dissolution of the company shall be determined on, voluntarily or otherwise, the trustees, acting under the permanent trust, created and prescribed in section 6 hereof, shall be trustees to convert its assets and wind up its affairs. The proceeds of all assets received by them shall be applied by them absolutely, as the guaranty and redemption fund is required by the rules and regulations to be applied, preceding, and as may be further prescribed hereinafter.

Any portion of the guaranty and redemption fund remaining after providing for the purchase and retirement of all shares, as herein prescribed, shall be distributed to the owners of the trust shares, and of any other shares then outstanding, equally per share.

15. The owners of a majority of the trust shares, acting together, shall have the right to convey to the company, absolutely or in trust, permanently or temporarily, and subject to such conditions as may be stipulated in such transfer, any securities regularly yielding net income; provided, that the receiving and holding of such securities shall not subject the company to any prejudice, or embarrassment, or legal liability to pay any money on account thereof; and no such temporary transfer in trust shall be terminable until the well-established net income of the company from its regular business and other sources of permanent revenue shall be equal to the maximum amount to which it may be raised by such temporary transfer in trust.

16. Each holder of shares standing in his name on the books of the company shall be entitled to a certificate or certificates therefor, duly signed by the president and treasurer, with the seal of the company affixed and attested by the secretary of the company, and each owner of an interest in any of the trust shares shall be entitled to a certificate of the fact, signed by the chairman and attested by the secretary of the permanent trust, showing the extent of the interest, which interest shall be assignable and transferrable on the surrender of the certificate representing it, properly indorsed, as may be prescribed by the trustees, with the approval of the directors and the owners of a majority of the trust shares.

Tide Water Oil Company, producers, shippers and refiners of petroleum—Crude oil. General office, Bowling Green building, No. 11 Broadway, New York. Samuel D. Brown, president; W. W. Smith, controller; A. A. Summers, treasurer; C. R. Norman, manager; literage and export oil, shipping department; B. F. Warren, manager Domestic oil department; R. D. Benson, Geo. A. Keeney, managers paraffin and lubricating oil department.

HISTORY OF THE OIL FIRES IN THE OIL REGIONS OF AMERICA.

The first serious oil fire was at the famous "Merrick Well," Rouseville, on Oil Creek, Pa., April 17, 1861. The Merrick well was drilled into the second sand and began flowing oil at the rate of 2,500 barrels a day. The people of the neighborhood gathered around the well watching it flow. The gas came in contact with the fire in the boiler of the Wadsworth well about eight rods away and a violent explosion occurred. It is estimated that three

hundred persons were present when the explosion which set the Merrick well on fire occurred. Forty-two men were burned, 19 of whom died; 23 were maimed for life; 9 were burned up on the spot. Two men were seen to come from the direction of Oil City just before the explosion. After the fire was extinguished the only remains of the two men were two small piles of ashes and the iron binding of their valises. The Hon. Henry R. Rouse, for whom Rouseville, Pa., was named, was one of the unfortunate ones to be burned to death in the Merrick well oil fire.

HISTORY OF THE BIG FIRE ON OIL CREEK, PA.

On Wednesday, October 8, 1862, fire broke out on the Blood farm, at 3 o'clock, at its intersection with the Tarr farm, and in thirty minutes the fire had spread over 18 to 20 acres, and in three hours consumed 150 tanks, 30,000 barrels of oil and a large number of derricks, engine houses, offices and dwelling houses. During the conflagration the oil on the surface of Oil Creek took fire and the flames presented a grand spectacle. The loss was estimated to be $100,000. The following are some of the principal sufferers:

TARR FARM.

	Loss.
American Petroleum Company	$1,000
Smith & Curwin	3,500
Densmore Bros. & Co	2,500

BLOOD FARM.

	Loss.
Lehigh Company	$5,000
Collins Well	3,500
Burrows & Scott	2,000
Steel, Jackson & Co	2,500
C. J. Lloyd & Co	5,000
Filkins Well	5,000
Painter & Lauffer	6,500
Lee's Well	2,500
Maple Grove Well	3,500
Kelly & Patterson Refinery	4,000
Arner's Well	1,200
Duncan Well	1,500
Richardson & Copeland	1,800

This was the largest oil fire on Oil Creek up to 1862.

EDENBURG—KNOX, CLARION COUNTY, PA.

Central town of the Edenburg oil field. Edenburg-Knox has had more destructive fires than any oil town in America. The town was badly burned out in 1877, had a bad fire early in 1878, and again in the fall of 1878. This last was a great fire, enveloping the whole town. The town was built up again, and in 1879 was again burned, and yet a worse fire occurred in May, 1880, which swept away 70 buildings. Again on August 23, 1880, many of the newly erected buildings were burned.

BRADFORD OIL FIELD—M'KEAN COUNTY, PA., OIL FIRES.

On the 6th, 9th and 12th of May, 1880, three very destructive oil fires occurred in the Bradford oil field. May 6th Rew City was destroyed by fire, together with 54 derricks, tanks, etc. May 6th fire destroyed 101 oil derricks and oil tanks in the near vicinity of Bradford. Nineteen derricks and tanks were burned at Foster Brook, and 6 derricks in Tram Hollow, not including those burned at Rew City. On May 9, 1880, fire destroyed Rixford, together with 54 oil derricks, 3 iron tanks and about 75,000 barrels of oil. On May 12, 1880, a great oil fire swept through Tram Hollow, totally destroying Otto City, Midaughville and Oil Center, and burned 300 oil derricks, 12,500 barrel oil tank and a number of small oil tanks, with nearly 100,000 barrels of oil. Total 536 oil derricks burned in those three oil fires. In the fall of 1900 and 1902 the Bradford as well as the whole of the McKean county oil fields were visited with very destructive forest fires, over 1,000 oil derricks and tanks were burned.

PARKER'S LANDING—PARKER, PA., OIL FIELD.

Parker had two very destructive oil fires in the heighth of the oil boom in 1873-1874. At both fires the town was entirely destroyed.

KARNS CITY.

Karns City, Butler county, Pa., oil field experienced three very destructive oil fires in 1874. Sixty-four buildings in the heart of the city went up in smoke. September, 1876, 16 buildings were burned up and on March 5th, 1877, the Bateman house burned, Mrs. F. E. Bateman, three children and one guest perished in the fire.

TITUSVILLE, PA., OIL FIRE, JUNE 1, 1880.

Acme Oil Refinery and all buildings on Buffalo and Franklin streets near Oil creek were burned.

Second great Titusville oil fire, June 11th, 1886. Lightning struck iron oil tank at Acme Oil Refinery, the fire raged three days and nights. The fire departments from Warren, Corry and Oil City, Pa., were called and rendered assistance. The loss to the Acme Oil Refinery alone was over six hundred thousand dollars, and about that amount in buildings and bridges.

HISTORY OF THE GREAT BURNING WELL—CADWALLADER-ANCHOR OIL COMPANY WELL NO. 1, LOT 647, CHERRY GROVE, WARREN COUNTY, PENNA.

The gas caught fire from a match in the hand of a man nearby lighting his pipe, Tuesday afternoon, June 20th, 1882. At the time of the fire there were five 800-barrel tanks, two 1200, one 1000 and one 600-barrel tanks at the well. When the gauges were taken the afternoon the well caught fire there were 3,000 barrels of empty tankage and 5,000 barrels of oil. This was the amount of oil burned. The well burned for two weeks, when Victor Gretter and

Edward Humphrey succeeded in extinguishing the fire by shooting the casing head off with a small canon. A tapered casing nipple was screwed into a 5⅝ casing tee and at each end of the tee five joints of 5⅝ casing were screwed together and at each end of the casing a gate valve was screwed on the casing. After the tapered casing nipple was screwed into the casing tee and the ten joints of casing and the two gate valves were screwed together, the gates were opened. Twelve men at each end or near the gates picked up the casing connections with the tapered nipple in the middle and carried the whole connections together until the tapered nipple was centered over the well. The connections was lowered to allow the tapered nipple to go inside of the top of the casing of the well. The well was made to flow through the casing connections, then one gate valve was closed until all the fire was extinguished around the well, and at the end of the casing with the closed gate after the fire was out on that end the gate was again opened and the one on the other end was closed which extinguished all the fire about the well. The well at the time of the fire was producing 2,000 barrels of oil a day. The men received $4,000 for putting out the fire.

CLARENDON, PA., CLARENDON, WARREN COUNTY, PA., OIL FIELD.

The great Clarendon fire began at 8:30 p. m. July 4th, 1887, and in three hours had completely burned over the whole town.

HISTORY OF THE GREAT OIL FIRE AT M'DONALD, PA.

S. H. Cook Lot, Well No. 1, McDonald, Pa., Wheeling Gas Company, owners.

Drilled in the fifth sand Thursday morning, August 14th, 1891, it caught fire Thursday evening about 10 o'clock from a torch being lowered in the hole of the Abner Conkle well one location from the Cook well. The Conkle well was spudding at the time. The Cook well was producing 400 barrels an hour when it was burning. The well burned nearly seven days. A. B. Dally superintended the putting out of the fire. By unscrewing the casing head and with a tapering nipple tee, two gate valves and eight joints of casing, four joints of the casing was screwed in each end of the tee; the tee and tapering nipple were placed over the well and the fire extinguished.

THE SAD AND DESTRUCTIVE FIRE ON OIL CREEK—FROM TITUSVILLE TO OIL CITY, PA.

The most appalling disaster occurred Saturday and Sunday, June 4th and 5th, 1892. Heavy rains raised Oil and Pine creeks to such a heighth that mill dams at Spartansburg and Riceville gave way, precipitating a vast mass of water upon Titusville Saturday night. With a roar like thunder it struck the town. Sleepers were awakened by the restless tide and drowned. Refineries and tanks of oil caught fire and covered acres of the watery waste with flames. Sweeping into the yards of an oil refinery at the upper end of Titusville, the water tore open a tank containing five thousand gallons of gasoline. Farther down an oil tank and gasoline tank were rent in twain. Water covered the streets and shut people in their houses. The gas works and the electric light plant were submerged, and the city was in darkness. At midnight a curious mist lay thick and dense and white for a few feet above the water. It was the gasoline vapor, a half mile long a quarter mile wide and six feet thick, with a coating of oil beneath waiting to be fired. One arm of the mist reached into the open furnace of the Crescent works and touched the live coals on the grate. There was a flash, then the explosion came and death and havoc reigned. Helpless men, women and children tottered and tumbled and disappeared. The death roll exceeded fifty. The elements seemed to try which could work the greater destruction. At Rouseville, above Oil City, a large iron tank of benzine was undermined and upset on Sunday morning. The combustible stuff floated on Oil creek, which had risen four feet over the floors of houses on the flats. The gas fire in a boiler at a well near the Lake Shore railroad tunnel, at upper Oil City, ignited the cloud of benzine. An explosion followed such as mortal eyes and ears have seldom seen and heard. The report shook the city to its foundations, a solid sheet of flame rose hundreds of feet and enveloped the flats in its fatal embrace. Houses charred and blazed at its deadly touch and upwards of fifty persons perished horribly in the Oil Creek oil fire. That memorable Sunday, June 5th, 1892, was the saddest day Oil City and Titusville, Pa., ever witnessed. The awful grandeur of the spectacle at both cities and along Oil creek has had no parallel.

BAYONNE, NEW JERSEY, OIL FIRE.

Lightning struck three of the 35,000-barrel iron oil tanks at the Standard Oil Company's Bayonne oil refinery in the evening of July 4th, 1900, and burned for three days. The loss to oil and other property amounted to $3,000,000.

LAKE OF OIL BURNED AT BEAUMONT, TEXAS, JANUARY 20, 1901.

The famous Guffy and Galey well, known as the Lucas Beaumont gusher, was struck January 10th, 1901, and flowed uninterruptedly for ten days. It was estimated by the best of judges to flow from 10,000 to 50,000 barrels of oil a day. This immense lake of oil was so dangerous that the owners decided to burn it, but before it could be done safely it caught fire and 100,000 to 250,000 barrels of oil were burned.

SALEM, WEST VIRGINIA.

Fire nearly destroyed the oil town of Salem, December, 1902.

FIRES AT DRILLING WELLS.

In the early days as well as at the present time drilling wells have quite frequently caught fire, without a moment's warning from the gas which is frequently found in drilling wells and the derrick burned down and the driller and tool-dresser burned to death or disfigured for life. In late years one or two-inch steam pipe lines are laid from connections made with a stopcock or valve in the steam line near the engine in the engine house. The lines then runs along the walk and into the derrick at the base of the headache post, where a swing joint is used, and a nipple four feet long is screwed into the L of the swing joint. The upper end of the nipple is tied up in front of the headache post by a single strand of rope. In case of fire the string is cut or broke, the nipple is lowered to the floor in front of the hole. The steam is then turned on at the stopcock or valve in the engine house. The steam extinguishes the fire. Thousands of dollars worth of property and countless lives have been saved by this method. Every drilling well when rigging up should make the derrick steam connection, called jet or snuffer, before starting to spud or drill.

OIL SHAFTS AND DEEP WELLS.

Many, in the early history of oil developments entertained the idea of sinking shafts so as to obtain oil in vast quantity, and then, as it were, to tap the fountain at its head. Instances are recorded of such shafts being sunk to a depth of from two hundred to five hundred feet, in Burmah, which have yielded large quantities of oil for hundreds of years. In these Burmese shaft-wells, the mode of lifting the oil is not remarkably skillful, the entire work being accomplished by buckets. When it is necessary to clear the shafts, men are let down by means of ropes, and they often die from the effects of the gas. Life, however, is cheap in that country; and there is no difficulty in keeping the wells clear at moderate cost. The first oil shaft sunk in this country, was near Tarentum, in Allegany county, about twenty miles above Pitttsburg, which was finished in the latter part of 1859. The third sand in this locality is found at a depth of not much less than two thousand feet, and as the shaft was sunk to a depth of only one hundred and sixty feet, it is needless to say that little or no oil was obtained. The salt wells of that section, which usually penetrate to a great depth, have always yielded more or less oil mixed with salt water.

On he south side of the Allegheny river, opposite Tidioute, is a shaft, sunk in 1865 by the New York Enterprise and Mining Company. The aim of the company was to penetrate, if possible, the third sand, and then tunnel into it. The Tidioute shaft is the only one in this country which has penetrated the third sand. The shaft is twelve by eight feet in width, and a hundred and sixty feet deep. Upon striking the oil rock, holes were drilled at various angles, and quite a large amount of rock was removed and brought to the surface. The men worked in tours of eight hours each, and the shaft was kept supplied with fresh air by means of a powerful air blast. At the end of one of the tours the men came up to the surface, the engine was for some reason stopped, and the gas accumulated. The two gangs of men were seated on the curbings round the edge of the shaft, and Mr. Hart, the foreman, occupied a position on a plank directly over the mouth of the pit. As a preliminary to descending, one of the men dropped a lighted taper into the shaft, which was instantly followed by a powerful explosion. The men were thrown violently back from the curbing, and as soon as they recovered from the shock, they found that Mr. Hart had disappeared into the pit below. The body of Mr. Hart was found in a shockingly mangled condition, having been tossed from beam to beam on its way to the bottom. His death, more than anything else, put a stop to the operations—at least no work was ever done after that.

A second shaft well was put down at Tidoute, about the date of the one described above. I have, however, been unable to obtain reliable data in regard to it.

Another shaft was sunk near the Hyde and Egbert farm, below Petroleum Centre. Work was suspended on reaching one hundred and sixty feet, owing to the large flow of gas, and the great cost of the undertaking. In November, 1865, Mr. Jonathan Watson, of Titusville, Pa., conceived the idea of drilling a well beyond the third sand, in the hope of reaching a fourth sand. Drilling on this well was prosecuted for upwards of two years without reaching the fourth sand. This well was cased with three and a quarter inch casing, to its full depth of two thousand one hundred and thirty feet, and pumped, but without any show of oil. This enterprise cost Mr. Watson upward of twenty-five thousand dollars, and was the deepest drilled well in America at that time.

EARLY FLOWING OIL WELLS ON OIL CREEK, IN PENNSYLVANIA, FROM 1861 to 1864.

Foster Farm.

The Sherman Well.—In May, 1862, there was but one producing well on the Foster farm and that was called "The Sherman Well,"—and that was struck in March of the year first named. She strated off at 1,000 to 1,300 barrels, and was for some months the largest well "on the Creek." "The Sherman Well" continued to flow until February, 1864, gradually diminishing. Her daily product as a pumping well was quite large, and she held out for two or three years.

"The Sherman Well" lease was the property of Mr. J. W. Sherman, then a resident of Cleveland, Ohio. He came to the oil region in the early days of petroleum, in somewhat straightened circumstances. He had some means, but not enough, as the sequel proves, to complete his first well. He obtained a lease upon the Foster farm below Shaffer, on the Creek, and commenced the work of drilling a well. Passing over the trials and embarrassments encountered in getting ready to drill, he finally began his enterprise, employing "spring pole power." In the first sand he had a good show of oil, but long before he reached the second sand his money gav out; and he was compelled to shut down. The "spring pole" had become powerless to work the tools effectively, and a horse or steam power was indispensable. Mr. Sherman waited for something to turn up, by which he could obtain either a steam engine or a horse. After many days of waiting, an interest in the well was disposed of for an old horse—and the work proceeded. Two or three weeks of horse power drilling, and the labor became too heavy for "Old Pete." Another one-sixteenth was sold to two gentlemen who owned a small steam engine, and work was again resumed. Coal was an expensive item, and it could not be had without the ready cash and not one of the owners could muster enough to buy a single ton! Another halt!

A week's delay and another interest was forced upon a reluctant purchaser for "$80 in cash and a shot gun." Just before the last dollar of this money had been expended, the tools penetrated the third sand, and the Sherman commenced to flow at the rate of 1,000 barrels per day. The fortunes of the plucky lessees were made—they had "struck ile" indeed. The Sherman continued to flow for two or three years, finally coming down to a pumping well. It is safe to say, the product of this well enriched its owners in fabulous degree, for its total receipt for oil sold is estimated at $1,700,000.

Soon after the Sherman began to flow, a dozen or more wells were drilled upon this farm, but they were mainly non-productive. Mr. Frederick Crocker put down one well on the farm, which he pumped two months steadily, when she started off at the rate of five hundred barrels daily. The Crocker well had a short career, however. The surrounding wells let down the surface water and soon drowned her out. She produced for a year or more and was then abandoned.

LOWER M'ELHENNY FARM.

This farm was purchased by Capt. A. B. Funk, in the fall of 1859, of David McElhenny, the original proprietor, for $1,500—McElhenny reserving on-quarter of the oil. In the spring of 1860, the work of development began, and the first well drilled was named the Fountain. It was put down with spring pole power to a depth of 260 feet. To reach this depth required months of labor, running into the winter and spring of 1861. During the early months of the latter year, the spring pole process was abandoned, and a small locomotive boiler and a stationary engine were obtained, and with this the drilling was completed. At this early day few, if any wells were drilled below the second sand, obtained generally at about 160 feet. Capt. Funk was inclined to abandon this well at 260 feet in depth—100 feet below the only oil-bearing rock yet discovered. His son, A. P. Funk, then and afterwards in charge of operations upon the farm, determined to sink it still deeper, persuaded that another oil rock could be found.

The well was completed in May, 1861, the tools having reached the third sand, and perforated it to a depth of sixty feet before the slightest evidences of gas or oil were visible. Its entire depth was 460 feet, and the top of the pebble rock or third sand was struck at 400 feet deep. When the oil was reached, the drilling tools were hammering away at the bottom of the well, and the first intimation the drillers had of the presence of oil was the gradual rising of a foam, under which was a volume of water, bubbling and rushing over the top of the conductor. This continued for some moments, the column of water, mixed with oil, steadily rising to the height of eight or ten feet above the conductor, when it seemed to explode, and the oil followed in immense volume, rising to the altitude of the derrick and above it.

This was the first well put down to the third sand in the Pennsylvania oil region. It was, as before remarked, named the Fountain well, and produced (flowing) 300 barrels per day for about six months, and then stopped short—instantly, it is said, and never afterwards produced a barrel of oil. It was agreed upon all hands that the well was destroyed by paraffin, for the lead pipe from it to the tanks—two hundred feet distant—was completely filled up with it to such solidity that a sucker rod could not be driven through it with a sledge hammer. Only thirty feet of tubing was ever used in the well, and the hole doubtless presented the same appearance as to obstructions as did the lead pipe. The verdict therefore was, the Fountain well was destroyed by paraffin.

The Empire well, same farm, was put down by Bennett & Hatch, lessees, and was completed about the 20th of September, 1861. The Empire had the same sands and the same depth of third sand as that found in the Fountain well. When struck, she started off at 2,500 barrels. Six weeks after she began to flow, 2,200 barrels was her regular daily product. She flowed nearly eight months gradually falling off to about 1,200 barrels, when in May, 1862, she, like her predecessor, the Fountain, stopped suddenly and as mysteriously as did her consort, but not with the same fatality as to future profit. The Empire was soon afterwards cleaned out and the pump applied to her and for some months she produced to 600 barrels per day, and then fell off and for eight or nine months gave out about 300 barrels per day.

There is one incident connected with the history of the Empire well which will bear repetition. While in the height of her flow one month's product was

sold to Bradley & Son of Cleveland, Ohio, for five hundred dollars. Not less than 100,000 barrels of oil poured out of her during this thirty days' transfer, for which her owners realized not more than five cents per barrel.

The lower McElhenny farm was among the most prolific of flowing well localities on the Creek. After the Fountain and Empire wells were struck the farm became rapidly studed with derricks, engine houses, and all the paraphernalia of an oil producing locality. The Davis and Wheelock well was struck in the fall of 1862 and daily poured out 1,500 barrels. The Densmore well No. 1, struck about the same time, flowed 600 barrels per day. No. 2, same party and name, 400 barrels per day; and No. 3, same owners, about 500 barrels per day. These latter wells were all struck about the same time—in the fall of 1862, and were all put down upon a two-acre lease. The Crocker well was struck about the same date and flowed 1,000 barrels daily. This well was owned by Mr. Fred. Crocker, of Titusville.

To these noted flowers of the lower McElhenny farm may be added to the Hibberd well, struck in March, 1863, and started off at 400 barrels. The American well, struck about the same time and flowed 500 barrels. The Canfield well, struck in the summer of 1863 and flowed 400 barrels

During the fall, winter and spring of 1862-63, the daily product of the lower McElhenny farm was between five and six thousand barrels. Oil was sold from this farm, during the years just mentioned, as low as 10 cents a barrel; the average price, however, being 25 cents per barrel, the purchaser furnishing his own barrels. In the spring of 1864 better prices were realized; oil being sold from tanks on the farm at $5.00 per barrel.

THE ESPY FARM.

This farm, adjoining the lower McElhenny, had some noted flowing wells in the early days of petroleum development. The Buckeye well was one of the most famous. She was completed in September, 1861, and flowed 1,000 barrels per day; while there were other good producing wells upon this farm, they were small compared to those upon the McElhenny farm. The Buckeye was a famous producer. The tanks to receive her oil were set up on the hill above her, two hundred feet, and for a year the oil was forced through a lead pipe into those tanks from the well.

HYDE AND EGBERT FARM—PETROLEUM CENTER.

Dr. A. G. Egbert, then an enterprising and wealthy resident of Franklin, Pa., purchased or contracted to purchase the Davidson farm, of its owner and occupant, in 1860. Later, Mr. Davidson died, and some difficulty was experienced in obtaining a clear title to the property. Without further detail, we may add that all was cleared up, and in 1862, Charles Hyde, of Hydetown, became a purchaser of one-half the property from Mr. Egbert, who, meantime had effected a settlement with the widow Davidson, agreeing to pay her $2,625 and one-twelfth of the oil for a deed of the farm. This sum, $2,625, Mr. Hyde paid to Dr. Egbert for one-half his purchase from Mrs. Davidson.

Prior to this sale to Mr. Hyde, or in the spring of 1861, a well had been drilled upon the property. This was called the Hollister well and when struck the oil flowed in great volume, flooding everything about the derrick. The lessees had contracted to deliver to the landowners their one-half royalty in barrels. Barrels could not be obtained in sufficient quantities at any price, and $3.50 to $4.00 was demanded for all that could be procured. Oil was selling at 25 to 30 cents per barrel. The drillers, therefore, abandoned their enterprise and the well was never tested. It continued to flow for some days, the oil running upon the ground. The lessees could not afford to barrel that portion going to the land proprietors for it would cost them more than the entire product was worth.

The Jersey well was one of the famous flowers of the Hyde & Egbert farm, and was the property of a company of Jerseymen, and was struck in the spring of 1863. It produced from the start 350 barrels per day, and this product was maintained with little variation for quite nine months.

The Maple Shade well—working interest—was the property of an organized company, The Maple Shade Oil Company, and was struck August 5th, 1863. Its product was 800 barrels per day, and continued at this standard for eight or ten months. It was a steady flower, and brought its owners a large amount of wealth. Dr. A. G. Egbert informed the writer that during its life its aggregate net earnings and clear profits were more than $1,500,000.

The Coquet well, Hyde & Egbert farm, was struck in the spring of 1864. The Coquet was pumped for ten or twelve days, when, upon drawing the sucker rods, in order to relieve her of an excessive quantity of gas, she began to flow largely and for a few days produced 1,000 to 1,200 barrels. She finally settled down at 800 barrels and continued for many months at this standard.

CHERRY RUN OR RYND FARM.

The Reed Wells.—The original Reed well was struck on the 18th of July, 1864, and flowed 280 to 300 barrels per day. The lease upon which this well was located consisted of one acre of land, and upon this small tract the lessees put down four wells, all proving abundantly productive. Mr. William Reed was the original lessee and before he succeeded in getting down the first well—the Reed—he was joined by one or two parties with a little money. After the well was down to a proper depth, it had every appearance of a dry hole. Several days were spent in pumping and testing it, when she began to flow at the rate of 300 barrels, and continued to produce largely for two or three years. The other three wells upon this lease added to the product considerably, and in the end netted handsome fortunes to the owners. One-quarter of the land interest belonged to Mr. Cresswell, who

came into the enterprise plethoric with a lack of greenbacks, was sold soon after the first well was struck for $280,000 to the Mingo Oil Company, of Philadelphia, Mr. Cresswell having previously realized from the product of the well $30,000. Mr. Reed, after realizing $75,000 from the sale of oil from the well, disposed of his one-half interest in the property to Bishop, Bissel & Co. for $200,000. Mr. Frazer, who owned one-quarter of the property, and who had received from sales of oil from the well more than $100,000, subsequently disposed of his interest to other parties for $100,000. This in round numbers makes a total of $785,000 realized by the original proprietors for the working interest of the Reed well and lease, and all within ninety days from the commencement of operations. The purchasers made money from their investment, for these four wells continued to produce largely, two or three years after they passed out of the hands of the original owners. Multiply $785,000 by two and we have $1,570,000 as the grand total realized by the lessees and subsequent purchasers. Add to this princely sum the amount received by the land interest and it is safe to estimate the profits of this one oil operation at $2,000,000, and this is only one of the many having like fabulous history.

TARR FARM.

The Phillips well (No. 2), Tarr farm, was struck on the 14th of November, 1861, and commenced to flow at the rate of 3,000 barrels per day. Oil at that date was sold as low as fifteen, and even ten cents per barrel. Thousands of barrels of the product of this well for want of barrels—worth then at the well $3.50 to $4.00 each—ran off into Oil Creek, or were allowed to waste in various ways. In December, one month after the Phillips well began to flow, she produced by actual measurement three thousand nine hundred and forty barrels in twenty-four hours. She finally settled down to 2,500 to 3,000 barrels, and maintained this standard for months. The owners of interests in this marvellous well were accustomed to take their portion of the product by the hour. A rude trough made of six-inch boards was constructed from the Creek to the tanks, and as boats could be obtained and sales made, the oil was let on and run two, three five, or more hours in each owner's interest. If the boats, barges, barrels or tanks—supplied as fast as possible—filled up before the expiration of the party's allotted time, the oil ran into the creek or upon the ground, and was thus wasted and lost.

Samuel Downer, Esq., later the proprietor of the Downer Oil Works at Corry, was one day standing at the discharge end of the leading trough, which had half an hour before been thrown from a flat boat just filled. The oil was running into the creek in a volume as large as the trough would hold. "See here," said Mr. Downer, "don't you know you are wasting a hundred barrels an hour here?" "Yes," said the interested party addressed, "but what am I to do with it? You won't give five cents a barrel for it; and I can stand a loss of five dollars an hour rather than let you have it at that price." Mr. Downer passed on up the creek.

The lessees of this portion of the Tarr farm had obligated themselves to give one-half the oil, and deliver it to the landowners in barrels. For a few weeks after the well was struck the flow was stopped by means of a stopcock. The question of barrels was finally adjusted and the flow began again, as above stated, in December, 1861. The product of this well is variously estimated; some put it as high as 750,000 barrels, and others at 1,000,000 barrels. The Phillips flowed for a year or more, her product lessening, when the pump was applied, and she produced largely for twelve years. and was shut down as late as May, 1873, when her product was from seven to ten barrels per day.

During the "stock company epidemic" in 1854-5, all but the land interest of this well was stocked at a fabulous sum—one or two million dollars. While she had vigorous life and marvellous product, oil was sold from her immense wooden tanks as low as ten cents per barrel, and as high as $13 per barrel.

The Phillips was 491 feet deep and had 60 feet of oil rock.

The Crescent well, Tarr farm, was drilled by N. S. Woodford during the summer of 1861, with a spring pole, and to the first sand. This was the first well put down upon the Tarr farm. She flowed thirteen months and twenty days, averaging 300 barrels per day, and shut off in an instant, and never afterwards produced a barrel of oil. In 1871 efforts were made to resuscitate the Crescent, but without avail. The well was cleaned out, drilled deeper and pumped for several weeks, but it was a dry hole. During the life of this well, oil was sold at such low rates, that while there was little or no expense attending its running, beyond tankage, not a dollar of profit or dividend was ever realized by any one of its owners. She, however, paid for herself, but the landowners claim to have lost money in outlays to save their portion of the product.

The Woodford well, Tarr farm, was put down by N. S. Woodford, in the winter of 1861. This well was located within a few rods of the Phillips well and soon after she began to produce—two thousand barrels per day—the water flooded the Phillips and materially affected her flow. When these wells became pumpers, neither would give out oil unless both were in motion. When the Woodford shut down the Phillips produced only water, and vice versa. A compromise was subsequently effected by which both wells were to be operated at one and the same time, and each to have one-third of the product of the other well.

There were several large flowing wells upon the Tarr farm during the early developments there, from 1861 to 1863-4. Phillips No. 1, struck in June, 1861, flowed 600 barrels per day; Elephant No. 1, completed in December, 1861, was a bountiful producer—600 barrels per day; the Union, struck in April, 1862, measured out 300 barrels per day; the Eagle started off August, 1862, at 100 barrels per day, and later, August and September, 1864, the

Cornwell and Sterling each produced one hundred and twenty barrels per day.

The great flowing wells of the Tarr farm in 1861 and 1862 were closely followed by others at various points on the creek. The Van Scyke well on the widow McClintock farm yielded 1,500 barrels per day; the Brawley well, on the Buchanan farm, 1,000 barrels per day; the Blood well, Blood farm, 1,000 barrels per day; the Noble well, Farrel farm, 2,500 barrels per day, and others which we have already mentioned in more detail, in this connection.

PIT HOLE IN 1865.

In January, 1865, the famous United States or Frazer well was struck on the Thos. Holmden farm, in a ravine on Pit Hole creek, six or eight miles from its mouth and almost as many miles from any other developments. "This intelligence," I quote an author, "who was himself of the moving mass," naturally created some excitement in the restless world of Oildom; but the spring floods of that memorable year, as well as the attractions to enterprising operators afforded by more accessible localities, for several months prevented extensive developments in the direction of the new discovery. Indeed the town could boast of only two buildings by the end of May, although the production of the United States well had steadily increased, and was then fully eight hundred barrels a day. However, the beginning of June witnessed the striking of the Grant well, a spouter of twelve hundred barrels magnitude, and forthwith commenced the rush for the inviting hills and dales of Pit Hole, which resulted in the rise of a city in soome respects the most wonderful the world has ever seen. Capitalists eager to invest their greenbacks, thronged in thousands to the spot. Labor and board commanded exorbitant rates; every purchasable farm for miles around was immediately bought at a fabulous price; hundreds of wells were begun with the least delay possible. New strikes continually intensified the excitement. Speculators roamed far and wide in quest of a source of wealth that promised to outvie the golden treasures of California. The value of oil lands was reckoned by millions; small interests in single wells brought hundreds of thousands of dollars. New York, Boston, Philadelphia, Chicago, and numberless other lesser centers, measured purses in the insane strife for territory. Money circulated like waste paper, and for weeks the scene recalled the wildest fictions of the South Sea Bubble or Law's Mississippi Scheme.

Everything conspired to favor the growth of the city. The close of the war had left the country flooded with an inflated currency, besides throwing many thousands of energetic men upon their own resources, and hundreds of these flocked to the latest Oil-Dorado, which presented manifold inducements alike to venturesome spirit, the active speculator, the unscrupulous stockjobber, the needy laborer, the reckless adventurer, and the dishonest trickster.

Some time previously the Holmden farm had been purchased for $25,000 by Prather & Duncan, who surveyed the greatest portion into building lots that found ready sale at figures varying from $300 to $15,000, which latter sum was actually paid for the site of the Danforth House. Before the end of September the improved Chicago boasted a population variously estimated at from twelve to sixteen thousand, including the daily average of transient visitors. The postoffice required seven clerks, and transacted a volume of business that ranked it third in the State, Philadelphia and Pittsburg alone surpassing it. Hotels, theaters, saloons, public halls, and places of general resort could be counted by the score. A fire department was organized; stores and dwellings sprang into existence as if by enchantment; a railway to Reno was projected and completed almost the entire distance, and the unpoetic name of Pit Hole became familiar to every newspaper reader throughout the civilized world. Incredulous foreigners, unaccustomed to the suddenness of Americans, with unfeigned astonishment, learned that in the brief space of three short months a dense forest had been transformed into a bustling city, possessing nearly all the conveniences and appliances of old established towns—a city, the wondrous story of whose dazzling rise and unexampled fall sounds even now like the weird romance of ancient fable. What a rich field for a graphic sketch of fortunes reverses, of feverish excitement and unhealthy speculation, does the history of Pit Hole offer to some later Scott or Dickens.

But, alas, the youthful city was destined to decline as rapidly as it had risen. In October the production of the wells fell off largely; the laying of pipe lines to Titusville and Oleopolis forced hundreds of teamsters to seek employment elsewhere; two destructive fires helped to accelerate the final disaster, and January dawned upon a comparatively deserted city, with scarcely anything more than long rows of empty buildings to indicate its former greatness and short-lived prosperity.

Many of the finest structures were removed to other places and not a vestige of the first wells is to be seen.

I add a single projected transaction of the Pit Hole furor in 1865, as an index to scores of others of like or very like mammoth proportions.

In July, 1865, Mr. George J. Sherman, Henry E. Picket and Brian Philpot, then residing at Titusville, contracted with Messrs. Prather & Duncan, the owners, for the purchase of the Thomas Holmden farm, at Pit Hole, for $1,300,000; The farm contained about two hundred acres of land, and at the date of this contract, July 24th, 1865, was producing 3,500 barrels of oil per day, and had one hundred wells going down, at half royalty, and was besides part and parcel of the city plot of Pit Hole, upon which were building leases, netting $60,000 per annum. Dwellings, stores, shops and hotels were begun and completed every day. The contract spoken of was for the purchase of this farm, just as it was, and thirty days were stipulated as the time in which to make the first payment of $300,000.

Mr. Sherman proceeded to New York with his

contract, survey, statistics, etc., to interest parties there in the scheme. A few days subsequent to his arrival in New York he secured purchasers of his contract from Prather & Duncan at $1,600,000. The preliminaries were all settled upon, and a committee of the purchasers was selected to visit Pit Hole, to make examinations and ascertain if the property was up to its representations. On the very day the committee were to leave New York for the oil region the great Ketchum forgeries were announced, and as many of the gentlemen interested in this "Pit Hole oil scheme," were victims of Ketchum's rascality, the journey was abandoned and subsequently the whole thing fell through.

In this dilemma, Mr. Sherman telegraphed to Mr. H. H. Honore, a wealthy gentleman at Chicago, giving him an outline of the property he had for sale and urged him to meet him at Titusville in five days, prepared to close up the transaction. Mr. Honore and a party of Chicago capitalists made good Mr. Sherman's appointment, and after going over the property, reopened negotiations with Duncan & Prather, who, in lieu of the $400,000 cash stipulated as the first payment, agreed to take that amount in real estate situated in Chicago. To this end Duncan & Prather were to visit Chicago, examine the real estate—which was to be priced by disinterested parties—and close up the sale. Delays followed—Messrs. Duncan and Prather were a week or more in reaching Chicago, and once there they hesitated and finally declined to receive real estate in Chicago as payment for their property. Among the many valuable properties offered was Honore's block, adjoining the Tremont House—at $175,000—since valued at $500,000.

The contract for the sale of the Holmden property had been renewed and the time extended two weeks. This extension had only about five days' life—and a Sunday intervened. Messrs. Duncan & Prather had left for St. Louis, intending to return home on the following Tuesday. Judge Beckwith, the attorney for the Sherman party, advised a tender of the first payment, $400,000, in greenbacks. This was late Saturday evening. On the Tuesday following, the $400,000 had been obtained and Mr. Sherman, Joshua A. Ellis, president Second National bank, Chicago, John G. La Moyne and Mr. Honore started for Titusville with their treasure for a legal tender. The contract required that the first payment should be "made upon the Holmden farm." The party had reached Titusville with their valuables in safety. Pit Hole was 12 miles distant and the country was just then infested by highwaymen of the meaner sort. Each of the gentlemen named provided himself with a pocket pistol and mounting horses—the $400,000 equally divided between then—they set out for Pit Hole. "It was the last day in the afternoon," and late at that, when the party reached Prather & Duncan's banking office. They entered, made known the object of their coming, and thereupon laid upon the bank's counter, in full view of Messrs. Prather & Duncan, $400,000 as a legal tender for the first payment as required by the contract.

The tender was declined. Messrs. Prather & Duncan claimed that the life of the contract expired with the setting sun, of that very day, and they would listen to no further negotiations. Suit was soon after commenced in the United States District court at Pittsburg, which finally terminated in a compromise, by which the Honore party obtained title to seven-eighths of the Holmden farm property.

Soon after the tender was made Mr. Samuel J. Walker, of Chicago, now one of the largest real estate operators in the west, became interested in the transaction, and he was the owner of the seven-eighths interest in the Holmden farm, as also of the Copeland farm adjoining. The sum paid for the seven-eighths interest in the Holmden farm is not known to the writer of this.

Pit Hole, however, developed a great many flowing wells, a few of which I make brief mention of hereafter.

"THE UNITED STATES WELL."

This well was located on the Thomas Holmden farm, and was the property of the United States Oil Company, struck on the 7th of January, 1865. The well flowed at the rate of 650 barrels at the start, and continued to flow, gradually falling off for quite ten months. The well ceased to flow November 10, 1865. The same farm developed other great producers. Among the most noted were the "Twin wells" —800 barrels a day. "No. 54," 800 barrels a day. "The Grant well," 450 barrels per day. "The Eureka well," 800 barrels per day. None of these, however, "held up" their product beyond six to ten months. The daily product of the Holmden farm for some time during the season of 1865 was 3,685 barrels per day.

Upon the Rooker farm, adjoining the Holmden, were several large "flowers," during the summer of 1865. Among the most noted were the J. R. Johnson, "No. 110," which spouted out 800 barrels per day; "No. 15," the property of Pratt & Sumner, which produced 400 barrels daily, and "No. 108," 400 barrels a day. Nos. 18 and 147, each 200 barrels daily. The daily product of the Rooker farm for several months was 2,230 barrels. Leases of one acre upon this farm were sold as high as $3,000 and one-half the oil.

"The Homestead well," at Pit Hole, located upon the Hyner farm, was among the "great flowers" of 1865, in this prolific territory. This well started off at 500 barrels daily. "The Arletta" flowed 250 barrels per day, and "The Stevenson, No. 2," produced 175 barrels per day. But these wells, as "flowers," lasted only about three months.

"The Burtiss Well" was struck late in the summer of 1865. It was located on the Copeland farm, Pit Hole, and flowed from the start, and for months after, quite 800 barrels per day. Besides "the Burtiss," there were upon this farm three other flowing wells. "The Rice well" gave out 300 barrels a day; "No. 1," 150 barrels per day, and the "Clara well" ran up to 300 barrels per day for nearly four months.

VARIETIES OF PETROLEUM.

PENNSYLVANIA OILS—QUALITY AND VARIETY.

The oil found in the Pennsylvania oil region is, for the most part a light lemon to a greenish color, and by some considered of a rather unpleasant odor. The specific gravity ranges from .820 to .782, or from 40° to proof 48° Beaume. The oil yields by distillation from 70 to 85 per cent of illuminating oil, which, when properly manufactured, should not vaporize and inflame under a temperature of 110° to 116° Fahrenheit.

Of lubricating oil produced in the Franklin district the specific gravity varies from .880 to .860, or from proof 28° to 32° Beaume.

The oil of Pennsylvania varies somewhat in color in the different districts and in the different sands. The black oil district of Pleasantville is so called from the fact that the oil is of a dark, inky, greenish color. This district extended from a little northeast of Pleasantville to the Story farm on Oil Creek, taking a northeast and southwest direction, and is in extent, as developed, about 12 miles in length and half a mile wide.

It is claimed by oil men that the rock in which the black oil is found is not a regular oil producing sand. They term it a stray sand, as green oil is found in a lower sand on the same land.

On the eastern portion, or upon the lands of the Shamburg and Cherry Run Petroleum Companies, is the dividing line between the green oil and the black. The line is defined sharply, as if by a plummet. The rock in which the black oil is found is nominally thinner than the green oil sand.

The cause of this coloring of the oil is reasonably attributed to the metallic composition of the sand, it being largely impregnated with oxide of iron. In the Modoc and Millerstown districts in Butler county, Pa., Southwest Pennsylvania, West Virginia, Southeastern Ohio and Kentucky the oil is of an amber color, with a very light greenish tinge. As before stated, oil differs in color and, to a slight extent, in gravity in the different sands, which, we think, can be fairly accounted for by the presence of iron in the composition of the sands.

The True History and Life of John W. Steele

Better known to the world as "Coal Oil Johnny," the greatest spendthrift and all 'round easy man that the oil country ever produced, from personal interviews with him by the author of this book.

John Washington Steele was born near Sheakleville, Mercer county Pennsylvania, May 23, 1843, and was the second child born to Anna Steele, the first being a girl, who was given the name of Permelia. She was two years older than Johnny, and on December 10, 1844, Permelia and Johnny Steele were adopted into the family of Culbertson McClintock, a well to do farmer, who lived on Oil Creek, in the county of Venango, Pennsylvania, across the creek from and slightly above the present site of Rouseville, three miles north of Oil City, Pa. Permelia and Johnny Steele were taught to address Culbertson McClintock as "Uncle Culbertson," and his wife Sarah they called "Aunt Sally." Those were the foster parents of Permelia and Johnny Steele. In the summer of 1853 Permelia, Johnny's sister, died at the age of 12 years. After the death of Permelia, Sarah Emily Scott was taken into the family. She was also two years older than Johnny. Hamilton McClintock, the father of Culbertson McClintock, the foster father of Johnny Steele, was one of the first settlers of the Oil Creek valley. He was born in Ireland, and settled on Oil Creek when he was a young man, and before his death he divided a large farm which he earned by hard labor, among his three sons, Culbertson, James and Hamilton, jr., the latter occupying the old homestead, situated on the site of the present and once thriving town of McClintockville. In those times the farmers living along that afterwards famous stream known to the world as Oil Creek were dependent for a livelihood upon produce off their hard and stony acres. Measured by the agricultural standard of other portions of the country, the land was not fertile, and the woodland to be cleared and the rocks removed presented obstacles which would have appalled a less hardy class of people. However, their tastes were simple and their wants easily satisfied, and ceaseless and untiring industry brought to the homes of many what in those days were comparative comforts. Culbertson McClintock did not live to see the golden flood of wealth which in later years swept down the valley, transforming the slow going agricultural valley into a beehive of industry, such as has never before or since been known in the busy oil regions of the world. On the 10th day of March, 1855, he died at the age of 45 and was laid to rest according to the wish in his will, which is as follows:

CULBERTSON McCLINTOCK'S WILL.

In the name of God, amen.

I, Culbertson McClintock, of Cornplanter township, in the county of Venango, in the state of Pennsylvania, being weak in body, but of sound mind and memory, thanks be to God therefor, and calling to mind the mortality of my body, and knowing that it is appointed for all men once to die, do make this my last will and testament, in manner following; that is to say, principally and first, I recommend my soul into the hands of Almighty God, who gave it, hoping through the merits of our Savior Jesus Christ to receive remission of all my sins and a happy admission into eternal bliss, my body I recommend to the earth to be buried in the graveyard at Cherry run meeting house; and as touching such worldly estate wherewith it has pleased God to bless me in my life time, I give, devise, bequeath and dispose of in the following to-wit:

Imprimis it is my will and I do order that in the first place all my just debts, funeral charges, be paid and satisfied by my hereinafter named executors, and that as soon as conveniently can be after my decease. It is my will, and I order that my hereinafter named executors shall at any time after my decease collect my outstanding debts, a portion whereof to be applied as hereinafter directed.

I give and bequeath unto my wife Sarah all that certain tract of land on which I now reside lying on Oil Creek, adjoining lands of John Rynd and John McClintock and other lands, containing about two hundred acres of land, with all buildings and appurtenances belonging thereto, to have and to hold during her life time, or so long as she shall remain my widow, and after her marriage or decease the tract of land to pass in fee simple into the hands of John Washington Steele, for him to have and to hold forever and his heirs after him.

I give and bequeath to Sarah Emily Scott, who is now of my family, one three year old heifer and two good sheep. I give and bequeath unto Sarah, my wife, all the remainder of my stock, which may be left after

my decease, together with the household furniture, loose property and farming utensils which is now belonging to my farm and all debts which may be due to me of any description to be collected by my executors after paying all my just debts and funeral expenses the remainder to be and remain the property of the said Sarah, my wife.

And lastly I do nominate and appoint John Rynd & Sarah my wife to be Executors of this my last will and testament, hereby annulling and making void all prior and other wills, hereby ratifying this and no other to be my last will and testament. In testimony whereof I the said Culberston McClintock have hereunto set my hand and seal the twenty-eighth day of February in the year of our Lord one thousand eight hundred and Fifty-Five.

CULBERTSON MCCLINTOCK. [SEAL.]

Signed, sealed, published and delivered by the said testator as his last will and testament in the presence of us who at his request in his presence and presence of each other subscribed our names as witnesses thereto.

THOMAS MCKNIGHT,
JOHN BLOOD.

Commonwealth of Pennsylvania, County of Venango, ss:

I, D. K. Buchanan, register for the probate of wills and granting of letters of administration in and for the said county, do hereby certify that the foregoing is a true and compared copy of the last will and testament of Culbertson McClintock, late of Cornplanter township, in said county, deceased, as proved before, and admitted to probate by the register of wills for said county on the 30th day of March, A. D. 1855, and as the same appears of record in said office, in Will Book No. 3, at page 151..

In testimony whereof I have hereunto set my hand and affixed the seal of said office, this 6th day of August, A. D. 1903. D. K. BUCHANAN,
[SEAL.] Register of Wills.

At the time of Culbertson McClintock's death Johnny Steele was less than 12 years of age and was attending school at what was then known as the McClintock school house, one mile down Oil Creek from the farm, and later he attended school at the Blood school house, situated two and one-half miles above the farm. At that time the school term was only four months of the year. One winter he attended the academy at Cherry Tree, an institution of learning of some pretensions for the time, and locality. It was at this school Johnny Steele graduated; that is, there ended his education, so far as schooling was concerned, except for a short period many years afterward. Mr. and Mrs. Culbertson McClintock were very religious and were members of what was called the Seceders' church, which was a creed supposed to represent the old time Presbyterian faith, and the meeting house they attended was situated in Oakland township, three miles from their farm. The old meeting house is standing there today. Such was the condition of affairs in the Oil Creek valley previous to the drilling in of the Drake well at the junction of Oil and Pine creeks near Titusville, Pa., August 27, 1859. As soon as the Drake well was struck and began producing oil it created a great deal of excitement, and on Monday morning, August 29, 1859, Johnathan Watson, of the firm of Brewer, Watson & Company, owners of the land on which the Drake well was drilled, mounted a horse and hurried down Oil Creek to secure a lease on the Hamilton McClintock farm, near the mouth of Oil Creek, which had an oil spring on it, and where the surface indications were even better than on their own tract, which had passed entirely from their control to the Pennsylvania Rock Oil Company. In the spring of 1860 J. D. Angier began drilling a well on the Hamilton McClintock farm, with a springpole, for Brewer, Watson & Co. In the middle of December, 1860, the well filled up and ran over with oil. This was the third well ever drilled on Oil Creek and the first one near the mouth, and was the beginning of the lower Oil Creek excitement. In a short time all the intermediate territory for 16 miles along the narrow valley of Oil Creek was soon leased and taken up.

The next farm adjoining and above the Hamilton McClintock jr., farm on the left side of Oil Creek, was the Archie Buchanan farm, and adjoining and above the Buchanan farm on the same side of the creek was the Sarah McClintock farm, the widow of Culbertson McClintock, the foster parents of John W. Steele. The lower end of the farm was leased in 1861 to Armstrong and Hathaway. The next to Armstrong and Hathaway's was the Hays Brothers Oil Co. Then the Chambers Oil Co., the Hammond Oil Co., the Vanslyke Oil Co., the Scott Oil Co., the Eldorado Oil Co., the Lone Star Oil Co., and the Henry Blackmore on the upper end of the farm. In the fall of 1861 and the spring of 1862 a number of large wells was drilled on the farm and Johnny Steele occupied his time by hauling oil in barrels with a team from the farm to the mouth of Oil Creek on the Allegheny river and to the railroad at Union City, Pa., and in the fall of 1862 he was married to Miss Eleanor J. Moffitt, the eldest daughter of Robert Moffitt, a well to do farmer of Oakland township, Venango county, Pa. They had known each other from childhood, had attended the same church and participated in the same neighborhood festivities.

Johnny Steele was 19 years of age at the time of his marriage, which was later blessed by the birth of one son, Oscar Culbertson Steele. Up to this period Johnny Steele had never been in a large city and from the stories of city life told him by the oil men he longed to visit one. So Mrs. Sarah McClintock, his foster mother, concluded that he should give up driving teams and take a partnership in the store owned by her nephew, David Hayes. She decided to send him to Pittsburg with Hays to purchase goods. This was before the days of railroad transportation down the Allegheny valley and they made the trip by steamboat.

This was his first trip to a city and on his return home he took up the position of buyer and deliverer, and started out on his first trip with a single horse and cracky wagon to buy produce for their small store.

To give the reader an insight into his shrewdness as a buyer, he drove to Dempseytown and called at Merrick's store and asked if they had any eggs to sell. He was told they had. He inquired the price and then asked how many eggs they could let him have. "About one hundred dozen," replied the grocer. "We have a few hungry oil men down on the creek, what will you take for the whole lot?" he next inquired, and the grocer named a lower figure than before, and was informed by Johnny Steele that he would take all the eggs and give the oil men something to eat. As a merchant, Johnny Steele was not a success. In those days the people didn't know the danger incident upon the handling of crude oil, and on the 18th day of March, 1864, Mrs. Sarah McClintock poured crude oil in the kitchen stove for the purpose of starting a fire therein. Doubtless at the time she thought there was no fire in the stove, and therefore was not prepared for the flash which followed, and which set fire to her clothing. She started to run from the kitchen into the open air, which increased the draft and fanned the flames from her clothes ,which blinded and bewildered her. She fell at the base of an apple tree near the kitchen door. She was horribly burned and died the next day, which was the 19th day of March, 1864. From that date began the career of John W. Steele, known to the world as "Coal Oil Johnny." After Mrs. McClintock was laid to rest beside her husband, Culbertson McClintock, in the cemetery at Cherry Run, the will of Sarah McClintock was found in the safe she had bought to store the money in as her share of the income of the oil bonuses and rentals from the farm. The will is as follows:

In the name of God, amen.

I, Sarah McClintock, of the township of Cornplanter, in the county of Venango, and state of Pennsylvania, being of sound mind and memory, and knowing the uncertainty of life, do therefore make and ordain publish and declare and acclaim this to be my last will and testament, that is to say after all my lawful debts are paid and discharged, the residue of my estate, real and personal, I give and bequeath and dispose of as follows:

To my cousin, Rachel McKnight, one hundred dollars in cash; to Sarah Emily Moffitt, two hundred dollars in cash; the remainder to John W. Steele. Likewise I make and constitute the said John W. Steele and R. W. McFate executors of this my last will and testament, hereby revoking all former wills made by me. In witness whereof I have hereunto set my name and affixed my seal this eighteenth day of March, in the year of our Lord one thousand eight hundred and sixty-four. SARAH MCCLINTOCK. [SEAL.]

The above was her last will and testament, and we, at the testator's request and in her presence have signed our names as witnesses hereto and written opposite our respective places of residence.

W. W. BROWN,
Cornplanter Township, Venango, Co., Pa.

JESSE MURTZ,
Cornplanter Township, Venango, Co., Pa.

Venango county, ss:

Personally came before me, H. B. Gordon, register for the probate of wills and granting of letters of administration in and for the county aforesaid, W. W. Brown and Jesse Mertz, the subscribing witnesses to the above will, who being duly sworn according to law, say that they were present and saw and heard Sarah McClintock, the testator, sign, seal, publish and declare the foregoing instrument of writing as being her last will and testament, and that at the time of so doing she was of sound mind, memory and understanding to the best of their knowledge and belief.

Witnesses:

W. W. BROWN.
JESSE MERTZ.

Sworn and subscribed before me this 22d day of March, 1864. H. B. GORDON, Register.

Letters granted to John W. Steele and R. W. McFate the 22d day of March, 1864. Recorded March 22d, 1864. Oath filed in the will. Revenue stamps five dollars.

Will of Sarah McClintock is recorded on page 344, Will Docket No. 3 at Franklin court house, county seat of Venango county, Pennsylvania.

After all the provisions in the will were complied with and all indebtedness was settled, together with all legacies, there was left twenty-four thousand and five hundred dollars, a farm of two hundred acres, with 20 producing oil wells thereon, one-eighth of all the oil produced going to the land owner, one house, barn and other small buildings, together with all farming utensils then and there became the inherited property of John W. Steele.

Soon after the demise of Mrs. McClintock, Johnny Steele went to Franklin, the county seat of Venango county, Pa., to consult with a lawyer as to his business interests. Already the news of an unsophisticated country boy having fallen heir to a large fortune had preceded him. He desired to find out what forms, if any, were necessary that his interests might be protected, as well as the interests of the oil men who leased various portions of the farm. The lawyer advised him to allow the leases to run on as they had been doing, and that when he became of age he could ratify them. It didn't take the lawyer 30 minutes to give him this advice and for which he charged Johnny Steele $500. He paid the money, however, without objection, as he reflected that at that time no one in the oil regions was transacting business to benefit his health. That 500 was the first peel off the roll of $24,500 found in the safe. He left Franklin and went back to his farm and attended strictly to his business, collecting his royalties and otherwise employing his time, and not in the slightest dreaming of the giddy whirl into which he was doomed soon to plunge. He always loved a good horse, and as soon as he got full possession of the property he satisfied his craving for a good horse. With the purchase of his first team of real good horses began that long line of misfortunes which finally landed him high and dry as a wreck upon the reefs of adversity. A devil always creeps

into a man's life in some way or other. The first Satan that crawled into his garden got there because of that pair of horses and the pestiferous devils caused him no end of trouble. One day he met a man by the name of Daniel Fowler ,who hailed from Meadville, Pennsylvania, and whose occupation was the selling of barrels to oil producers, as agent for a cooperage establishment. In his hearing Johnny expressed his desire to purchase a good team and he ventured the information that he knew where he could get one, that the horses were owned by a gentleman named Barton, who resided in Crawford county, not far from Meadville. Johnny went there and purchased the team. This was his second dip from the money box, and it was the only one that proved a profitable investment. He finally sold the team for more than he paid for it, the selling price being $1,000. In other respects, however, this visit to Meadville did not result so fortunately, and in many ways proved in the end to be more expensive than any he ever made. A country boy coming into possession of a fortune, which by hearsay, at any rate, grew to enormous proportions, with a probable income for the future which would prove much greater, he soon became known for quite a distance from his home, and each and every day he received invitations to visit newly made friends, among them came one from Daniel Fowler, the fellow who had engineered the horse deal. He was a plausible fellow of excellent address and a good entertainer, and Johnny at once accepted the invitation and went to Meadville to visit him. On arriving at the Fowler home he was introduced as one of the greatest and sharpest financiers on earth, and he was entertained better and with more consideration than he had ever known before, and one of those specially invited guests with whom Mr. Fowler made him acquainted was Mr. Horace Cullom. He had not been talking to Mr. Cullom many minutes before he made him a business proposition, the substance of which was that he proposed to erect a business block on a lot which he owned situated at the corner of Chestnut and Water streets, and he desired him to take a half interest. The inducements which he held out were so enticing that Johnny was not long in making up his mind to accept them, and he agreed to pay $45,000 for his share. Articles to this effect were duly drawn up, presumably by Mr. Cullom himself. Johnny Steele agreed to pay $5,000 down and $5,000 a month thereafter until the total was all paid in. Mr. Cullom was to superintend the putting up of the building and all Johnny Steele had to do was to put up his share of the money. In view of what later occurred it is proper to state here that either directly or through his agent he kept up these payments, and has in his possession at the present time a receipt for the whole amount he paid. We will now give the remainder of John W. Steele's history as he himself gives it.

In the course of the conversation which resulted in the building transaction, Mr. Cullom mentioned that he was the owner of a fine residence property, situated as I remember, at the corner of Crab alley and Chestnut street, in Meadville, and as I had been so willing to invest in the business block, he said he thought that possibly I would be willing to purchase the house and lot. This led me to visit the premises in his company, with the result that I purchased it for $10,000. At the same time I bought the Barton farm, where I had purchased the horses, for the sum of $7,000.

I knew as much about real estate as a pig knows about the dead languages, and afterwards discovered that I had granted a favor of considerable proportions instead of having been the recipient of one.

Mrs. McClintock died in March and the Meadville transactions occurred in the following May.

My Meadville friends still insisted on granting me favors, and Fowler having flattered me into a partial belief that I was the greatest and sharpest financier of my time, shortly after the date of the foregoing transactions I was induced to purchase several choice building lots, for which I laid down the snug sum of fifty-five hundred dollars.

My wife was in extremely poor health at this time, and had been for some months. I called in a young physician from Meadville to diagnose her case, a doctor whom I had met on my visits to that place. His advice was that a change of scene would be beneficial to Mrs. Steele's health. For this advice he did not charge me anything, for which I was very grateful. However, later he confided to me the desire to borrow six hundred dollars in order to take a further course in medicine, and I loaned it to him. He has it yet. At least he never returned it to me; and I have an impression that I paid pretty dearly for professional advice at that time, both to lawyers and doctors. The advice of the doctor, however, proved to be the most expensive in the long run, as it led me to Philadelphia, where, before I left, I disposed of a goodly sum of the coin of the realm in various ways. But I have always hoped that the "pill mechanic" finished his education and lived happily ever after.

The events here related, in connection with what occurred later, will show that I was gradually getting into a position from which I was to emerge eventually not only as a lamb shorn, but very greatly disfigured.

Following the advice of the good Samaritan "who took me in," I made arrangements to take my wife and boy to Philadelphia, hoping they would be benefitted by the change of scene and climate. My father-in-law had been a merchant in the Quaker City before moving to Venango county, and we had many friends and relatives in the city. So I hired an agent by the name of John Williams to look after my interests while I would be away, leaving instructions for him to report to me regularly as to business at the farm. This was in the latter part of May, 1864. However, before starting for Philadelphia, the famous Hammond well came in. It was located on the flat portion of the farm, down close to the creek. It flowed at the rate of 300 barrels a day, and proved the center of much interest and excitement. The income from this source promised to swell my income to no inconsiderable extent, and I jumped into greater "prominence" than ever as one of the lucky "oil kings" of the time. Special dispatches, greatly exaggerated, were sent out regarding this new strike.

No fortune ever comes easier to a man than the income from royalties on oil. In the first place, there is practically nothing to lose financially, the entire risk being assumed by the producer, and if a lucky strike be made, the money from the royalty comes so fast as to leave one in a kind of a trance. With me it was surely a case of "come easy, go easy." All I had to do at this time was to loaf around, smoke good cigars and watch my bank roll swell. Yet while it was all I was compelled to do, it was not all that I did. So much wealth bothered me, and I was itching with a desire, which I guess had always lain dormant in me, to get rid of it. The opportunity to do so arrived, and I took advantage of it.

Also about this time the Lone Star well was struck, which was a good one. At this period, too, I became acquainted with Mr. William H. Wickham, of New York city, afterwards mayor of that famous metropolis, I believe, and who at this time, like thousands of others was in the oil regions seeking investment. He was a member of the firm of Wickham & Jones, and when the Hammond well was struck he offered to purchase my one-eighth royalty right in the lease for $100,000. After some thought I agreed to accept his proposition, and one Saturday afternoon the bargain was verbally completed. It being late in the day, however, it was agreed that he should come to my place on the following Monday, when articles would be signed and I should receive the money.

But, alas! My fondest hopes were shattered, and fortune frowned where I expected to be favored with a smile. On Sunday the well stopped flowing, it having been flooded out by water on account of the pulling of the tubing from a couple of wells across the creek from it. I stood and gazed at the well, and realized that one- hundred thousand dollars had slipped through my fingers without the slightest trouble, and I felt worse about this than if some masked robber had held me and taken it from me forcibly. For the first time I realized how it felt to have my hand upon a fortune and then lose it, and for the first time I appreciated the feelings of one who had staked a fortune upon the turn of a card and lost.

However, in the present case the malefactor was nature, and while in later life I learned the uselessness of filing objections to her decrees, I was not so wise at this time, and some of my kicks were of the forcible variety.

But through the dark cloud of misfortune and disappointment I suddenly caught some glimmer of hope. I had not agreed to part with my interest in the Hammond well on the ground that it was a flowing well, and this presented to me a chance of which I tried to take advantage. As I have said, our agreement of Saturday had not been reduced to writing, and I figured that if I could get down to Oil City and have the papers drawn up and signed before Wickham started for the farm, all would be well, and my conscience would be clear. Of course, there was a probability that he would ask me if the well was still flowing, but I would not be able to tell for sure, as it might start up again during the night, and I would not visit the well before leaving for Oil City Monday morning.

It was early on that day when my agent, Williams, and myself hitched the fastest horse in the barn to a light buggy and started on a race down the creek for a hundred thousand dollar stake. Never did I take a trip in which I was so much interested. The horse ran most of the way, the mud was scattered promiscuously, and through the early dawn of that Monday morning inquiring faces peeped out at us from the windows of houses and from derrick doors. To get to Oil City before Wickham left was my one aim and purpose, and every other idea was banished from my head as we tore madly down the road.

It happened, however, that Wickham was also an early riser, for we met him just on the outskirts of the place. My heart was down in my boots, and I reasoned correctly that the "jig was up." Vainly I argued that he had better turn back, as I was going to Oil City on business, and while there we could draw up the papers and complete the deal. Whether he observed any traces of anxiety in my voice or face, I do not know, but I do recall distinctly that he said, "No, let's go up and take a look at the well first."

The blow was struck right there, all thoughts of the fortune vanished suddenly, and with sadness I turned my horse around and remarked with all the steadiness I could master, "All right, I'll go back with you."

I went back. I never let him know that I was trying to take advantage of a little oversight in language to sell my interest in the well. In fact, I told him I was pleased to discover that the well had stopped flowing, before he turned over the money, and he did not know how happy it had made me that he had insisted on going to the lease before completing the agreement. Yet I must confess, happy as I was, I have had far happier moments in my life. Of course, the agreement was called off, and I compromised with my conscience as cheerfully as possible by writing one hundred thousand dollars in the column of losses.

The newspapers printed a report to the effect that I received $200,000 for my interest in the well, which, in view of what actually occurred, was slightly misleading. However, it assisted in making my burdens heavier, as many hundreds of people, believing I was animated with a sincere desire to part from my money, offered their services as separators, and I received enough proposals of marriage to have caused the most pronounced Mormon to drop dead from joy. The current report that the Hammond well flowed 600 barrels a day was also wrong, but nearer the truth than the statement that I sold my interest in it.

In spite of the unsatisfactory outcome of the Hammond well transaction Mr. Wickham remained in the neighborhood and paid me an occasional visit. He informed me he was anticipating a trip to New York, and as this was about the time I intended leaving for Philadelphia with my family, he gave me a very pressing invitation to accompany him to his home. This I accepted, and arranged that my people should follow me in a couple of days, when I would proceed with them to Philadelphia. Wickham seemed to take a great interest in me; in fact, I thought treated me better than I deserved. Retaining a vivid recollection of the Hammond well incident, I would have taken it as more appropriate if he had refused to consider

that I was on earth. But later I came to a better understanding of his motives.

I went to New York with him, smoked his Havana cigars, played billiards with him, drank his good wines and feasted sumptuously. The sights of the city interested me. Unlike my trip to Pittsburg, I did not ride on the street cars, but in a stylish carriage driven by a coachman; and considered myself "It." Wickham introduced me to his friends as a smart young man and a great financier, but I could not guess the meaning unless he had reference to the team of horses which I had bought for $600 and sold for $1,000. I was so well pleased with this visit that my mind was made up to see more of the doings of large cities, and I did. I was beginning to see the world outside of the narrow surroundings of my previous life, and it was a world which attracted me more and more.

My family joined me in New York and we proceeded to Philadelphia. This was in June, 1864. Leaving my people with their friends in the Quaker City, I returned to the oil regions to see how matters were progressing. And it was on this trip to the Oil Creek farm that I discovered Seth R. Slocum.

This man Slocum was a man of the world, without all the refinements that sometimes go with such a character. His home was in Erie, Pa., and he belonged to a most excellent family. There was nothing in his face or bearing to attract any one, but he possessed a smooth tongue and an insideous manner, which enabled him to easily win the confidence of one as gullible as myself. The faculty of winning one's good will is a commendable one if rightly used, but is dangerous if it is not, and, as Slocum never showed any evidences to me of having a conscience, and as I became his willing follower, the result can be guessed.

I have seen people on the stage perform antics when under the control of hypnotic performers that they would not have performed for any inducement had they been in possession of their own will. And certain it is that under the spell of Slocum's influence I cut capers without the slightest protest or murmur that I would never have thought of had I been left to my own sweet self.

I found Slocum at the farm when I arrived there from Philadelphia, and he informed me that he was in search of work. In this way our acquaintance began. The conversation led from one topic to another, and his ready tongue and patronizing manner, which so often prove attractive to those not experienced in the ways of the world, allayed any suspicion I might have had and captured my imagination completely. In fact, I was not long in reaching the conclusion that Slocum was the best friend I had on earth, one who was solely animated with a desire for my welfare and happiness.

Therefore, when he volunteered to go to Philadelphia with me and "show me the town," at my expense, I considered he was doing me a great favor, and accepted his offer with pleasure, and agreed to pay the bills if he would perform his part of the agreement properly. I kept my agreement so far as I could, but Slocum's habits seemed to expand with age, as did my own, and when we were at the zenith of our career it kept a good healthy income busy to stay anywhere near us. Slocum kept his part of the bargain faithfully; in fact, I sometimes thought he went farther than he had agreed to do.

Arriving at the Quaker City with my newly formed acquaintance, I stowed him away temporarily at the Girard House and went to visit my family. I found the house in which they were stopping quarantined, and learned that my little boy was ill with the smallpox. Not being permitted to see him, I returned to the hotel and took up my quarters there, not feeling very cheerful over the dangerous illness of my son. However, in a few days he was reported out of danger, and having received news concerning my agent at the farm which seemed to justify a visit there, I started back and took Slocum along. He went with me because he volunteered to accompany me, and would not listen to a refusal. He had possibly already found out that I was a "good thing" and did not wish to lose me. I installed a new agent at the farm, by the name of William Blackstone, and Slocum and I returned to Philadelphia. Then in October I took my people back to the farm. It was on this trip to the old place that I saw Wickham after our New York visit, and he agreed to purchase the farm outright for $1,000,000. This I refused, and returned to Philadelphia and rejoined Slocum. However, Wickham sought me out in Philadelphia and renewed his offer for the property, but I again refused him; but after much bargaining it was agreed that I would dispose of the farm to him for $1,200,000. Of this amount he paid me $30,000 spot cash, which was to represent the rental of the farm at the rate of $5,000 a month for six months, and if at the end of said period I could make a clear deed to him, the $30,000 was to be considered as a part of the purchase price, and the balance of the $1,200,000 to be turned over to me.

Some time previous to the making of this bargain Hamilton McClintock, a brother of Culbertson McClintock, my benefactor, had secured a lease on the farm which I had not ratified, and he brought suit for the purpose of breaking the will of Culbertson McClintock, by the provisions of which I had come into possession of the farm at Mrs. McClintock's death. Therefore, this suit at that time stood in the way of making a clear title, and it was necessary for me to wait until the litigation had been disposed of. In the meantime Wickham took the farm on the terms agreed, put his agent upon it, and operated it for his own benefit. It was also agreed that if at the end of the six-month period I could not give a deed the $30,000 was to be considered only as so much rental, and the farm was to come back to me. Otherwise, the balance of the money was to be paid to me by Wickham.

Therefore, all I could do was to wait. I was temporarily out of the oil business, and with $30,000 in my pocket and with Slocum at my side, I started out on a little "painting trip," all the time harboring pleasant anticipations of the greater amount of money to

come in the future, beside of which the sum then in my possession was a mere bagatelle. The "beyond" looked rosy, and therefore Slocum and I in our enthusiasm began to sprinkle a little red throughout the possibly at times sober precincts of Philadelphia. The money I had received from Wickham was deposited in the safe at the Girard House, in a private box generously (?) loaned to me by the proprietor. Having known of several disastrous results from depositing money in banks, I considered this a safe place for my wealth, as I carried the key. I never deposited any money in a bank in Philadelphia, reports to the contrary notwithstanding.

As my transaction with Wickham occurred at the Girard House, it became known through generous advertising. On account of my youthful appearance I was stared at with a good deal of curiosity as the lucky possessor of millions, and I held regular receptions for those whose bank accounts were in a chronic state of depression. Chances came to me to purchase all kinds of property, to invest in all kinds of schemes, perpetual motion, and the like, and every one seemed willing to unload upon me every "flash" company in creation, some of them doubtless gotten up for my especial benefit; some of them so transparently crooked that I could see through them even when I was in a condition that would not have permitted me to walk a rope across Niagara. But I brushed all these offers to one side, and reached the conclusion to spend my money as best suited my taste and inclination.

It was at this time that I performed one of the greatest strokes of business of my career. It will give the reader of these pages an idea of the kind of a Napoleon of finance I was, and therefore I mention it. The stroke was this: I gave to Slocum a power of attorney so comprehensive and generous that he could handle all my money, draw upon my "bank" account and run bills in my name. I will do him credit by saying that, to the best of my knowledge he never failed to carry out every one of the conditions of that power of attorney to the fullest extent. He exhibited the most untiring industry in that direction, and I could have given him a letter of recommendation to that effect at any time. He always spent money when he had it to spend, or when he did not, and became expert in disposing of promises with great facility.

Slocum had an idea that in order to do things right, we should make the proper kind of a start. He argued that to see a couple of young millionaires walking around in ordinary clothing had a depressing effect on the spectators, and that we should have something more striking and that better befitted our station in life.

Under his guidance we went to a tailor shop. We looked at the different patterns and grades of cloth presented for our inspection, some of which I thought pretty good, and I saw a number of patterns that would have suited me. But Slocum had his ideas up that day. After showing almost everything in the store the tailor finally came to a piece of goods of a style that I considered would have looked well in a horse blanket for a blind horse. I thought, and do yet, that the tailor pulled out that piece of goods by mistake, or else showed it to us in order to scare us out of the store. But the pattern caught Slocum's eye, and he gave an order for two suits to be made from it, one for him and one for myself, to be constructed exactly alike. I told him that if we went out with a pattern like that we would be arrested for disturbing the peace of the city. But my partner was insistent and the goods were purchased.

I shall never forget the pleasant afternoon when we sallied forth in our newly constructed suits. In addition we sported "stove-pipe" hats, carried gold-headed canes, and wore diamond pins in our neckties. Surely Solomon in all his glory was not fixed up like either one of us. As we stepped out on the street Slocum was smiling and confident, while I was trembling and afraid. The street seemed to take on a new appearance when we struck it, as people all turned and looked back or followed us, and soon most all the traffic was going our way. On the corner of the street a block or two above the hotel a policeman was standing or was doing so until he saw us. Then he came towards us and stopped in front of us, and when he informed us that we would have to go to the police station with him I was temporarily paralyzed. As soon as I could regain my equlibrium sufficiently to talk, my first words were to Slocum, and I reminded him of what I had said, that if we appeared in that dodgasted attire some dodgasted cop would run us in. Slocum said nothing, but all the way to the police station he looked as crestfallen as a boy who has been discovered in the act of stealing jam. We were two surprised looking lambs as we stood facing the judge.

"Where did you get these fellows, officer?" inquired that personage.

"Sure, I picked 'em up down the strate," replied the minion of the law.

"What's the charge?"

"Bounty jumpin,' yer honor."

"Did any one tell you to arrest them?"

"No, sir. I arrested them on their looks, and if them burruds aint bounty jumpers, what be they?"

We assured the magistrate that we were two innocent young men from the oil regions, who had been in town but a short time, and had never received any bounty to jump; that while we did not exactly know what kind of a bird a bounty jumper was, no doubt the policeman had selected us because of our plumage; and if we could be let off we would never do it again, whatever it was that we had done.

The judge took in the humor of the situation and discharged us. I "cussed" Slocum all the way to his room and when we got there made him change his clothes. Then we ordered up drinks, celebrated our escape from the clutches of the law and closed the wide chasm of disagreement.

As I have stated, the transaction with Wickham occurred at the Girard House, and it attracted much attention. Rumor followed rumor as to the amount involved, and it soon became an accepted belief that I

had received a fortune amounting to at least a million of dollars. As a consequence my credit became unbounded, as did the notoriety which arose out of the affair. I became the cynosure of a thousand curious eyes as the formerly poor boy who had suddenly become possessed of riches which a prince might envy; and I started on a course of living which can be accurately described as "fast." Many foolish things were attributed to me, of course, of which I was never guilty, but I was at best leading a life which rendered many of the untrue surmises justifiable. Many of Slocum's escapades were charged to my account, but we were so much together that this could not be considered strange, and certainly his foolish actions were backed up by my money and credit. Therefore, I cannot wholly blame those faraway critics, who through the magnifying of rumors, attributed outlandish actions to me as a spendthrift "oil prince" of mushroom growth. The flattery of pretended friends and the misrepresentations of the newspaper press were not objected to by me so strenuously as in later years. In a kind of way I enjoyed the "jollying" extended to me even by those who were engaged upon a "leg-pulling" expedition. In the dazzle and glitter which surrounded us Slocum fairly swam, and acted like a man who had been accustomed to such things all his life, conducted himself like a spoiled and pampered son of riches, and spent my money as freely as any one could have spent it. The finest of clothes adorned our persons, diamond pins sparkled from our neckties, diamond rings glittered on our fingers, expensive gold chains encircled our necks and were attached to the most expensive gold watches. Similar articles were bestowed upon our friends. But these were mostly presented by Slocum, whose generosity was not even bounded by the size of my money roll.

Other misguided beings from the oil regions of Pennsylvania were scattered about the country, doing foolish things, any many of their performances were afterwards credited to us. But as I had played the fool in so many directions, it was not strange that this was so, as possibly I was the "king bee" of the oil region spendthrifts. I was not considered an "absorber" of wealth, but a "distributor," in the language of recent financial arguments. I sized up pretty well with the best, but have never been guilty of one-quarter of the foolish transactions that have been charged to my account; in fact, could not have mixed up in so many all at once. However, as it was, I did fairly well. While the original role of "Coal Oil Johnny" was played by me, to have acted it in all the comedies and possible tragdies in which that was the star part would have required me to project myself into a dozen or more places at the same time. It may be as well to state that at this writing I am alive, in spite of the fact that I have been killed several times. While I circulated at a pretty lively gait, and largely in my own particular orbit, still I was only one. My nickname seemed to have been catching, and was conjured with by writers whose fanciful imaginations overbalanced their regard for facts. But the ball was set rolling, and it gathered all kinds of "Coal Oil Johnny" moss.

The first time I ever heard the name was one day in Philadelphia, and it was applied to me by a dirty faced street gamin, who possibly never realized for how much he has been responsible. Three friends and myself were being driven back from the races to our hotel. Not having had a drink since we left the track, we were overtaken by a consuming thirst, and were urging the driver to do his best to get us to the hotel in order to save our lives. The rapid beat of the hoofs upon the pavement, and the rattle of the carriage, attracted the attention of those unfortunate ones who were compelled to walk. Seeing our carriage filled with four sporty looking individuals wearing high hats and diamond bedecked apparel, it was but natural that some one's curiosity should be aroused to the extent of asking who we were. Turning a corner slowly I heard some one ask, "Isn't that the coal oil crowd?" and an insignificant urchin piped up, "Yep, that's Coal Oil Johnny and his gang." The other occupants of our carriage also caught the remark. It seemed to please them, for they adopted it there and then, and fastened the term upon me for good. In this way was started a name that has stuck to me closer than a brother, and was destined to be bandied about wherever the English language was spoken.

Outside of our personal appearance on this occasion of my christening, doubtless our carriage attracted attention and in planning the vehicle Slocum and I determined that it should. In the first place we felt the need of a carriage of some kind, for, on many accounts, it was not always convenient to walk. On concluding to have one of our own we resolved it should possess some distinctive feature that would mark it from the usual run of stylish turnouts, and compel people to recognize it at a glance as our own particular property.

I had read somewhere that it was the custom of people to display a coat of arms to mark the distinguishing achievements and occupations of their family. Therefore, I concluded to try something of this kind myself. My idea was not so much to boast of any achievements of former generations as to show off my own business and attainments. So Slocum and I put our heads together and decided the best thing in this line to be done was to have painted on the doors of our vehicle the picture of an oil derrick, an oil tank and a flowing well. We found a painter who knew how to mix colors and put in the proper amount of red. The carriage had cost me $1,600. We had been painting everything else red, and we did not wish to take any chances with somber colors. The artist adorned the doors to our liking. When we saw the result of his work we could hardly wait for the paint to dry. But finally when, with our new team of horses, we were at last driven forth, with instructions to the driver to go slow, the sensation created was only equaled by our gratification that we had made the hit of the hour. The only experience we had had which equaled it was when we appeared in those flashy suits. But this time we escaped arrest. How it happened we never knew. In our new outfit we shone for all there was in it, and we did not care who knew it, as we were prouder of that carriage and its coat of arms than Barnum ever was of a car load of monkeys. I felt better than any old king ever did in his chariot. The only regret was that the folks up home could not see me, and I wished that some of the boys from the oil regions could come down

so that I could give them a ride. In my time I have seen many carriages, but to my mind they were all commonplace in comparison to the one owned by me. It was the only one of the kind, when the coat of arms was included, in the Quaker City at that time. It has never been duplicated, and I do not know how it could be.

We hired a man to care for our horses and our carriage for a stated amount, I forget the sum; but it was large enough, no doubt. The driver was a willing fellow, at any rate, and devoted himself entirely to us and our interests; and we often felt sore need of that devotion. His working hours were irregular, but mainly during the night and 'way long in the A. M.'s. He knew how to handle men as well as horses, for he was often compelled to handle us, and his responsibility often became great along toward the wee small hours. Our carriage was a familiar sight "down the line," and wherever it was, it was a safe guess that we were in it, or at least not far away.

Given an inexperienced young fellow with a good sized bank account and a willing and earnest desire to see the world, and include in this combination a thirst for liquor, and fasten on to this same fellow companions who are consumed with a desire to further his ambitions along the lines indicated, and you have a result that has thrown many an older head than I had at that time off the track. So, of course, I did many foolish things, some of which I look back to today with regret, and I presume I performed many outlandish tricks which I do not now remember, because of their being acted at times when John Barleycorn held me in an "extra loving grip."

I do recall distinctly, however, that one of our principal amusements was theatre going. The play house possessed attractions which I could not resist, and I became very familiar with life therein. It was to me a new world, and naturally possessed attractions for one who never until going to the city had seen anything more pretentious than a district school exhibition or a Punch and Judy show.

I was to be found many nights with my friends occupying a box at Fox's Casino, a famous resort of its kind, conducted on Bohemian principles, where a man was not obliged to crawl over a crowd to procure liquid refreshments, and where we could enjoy our fragrant Havanas while we sat and watched the gyrations of the ballet girls. Of course, such a resort appealed strongly to our temperaments and we frequented it more than any of the others then to be found in Philadelphia.

Carncross & Dixie's minstrels had quite a run in Philadelphia at this time, and I always enjoyed listening to the comical sayings of Dixie and Simmons, spurred on by Carncross, one of the finest of interlocutors. I became well acquainted with Dixie, who associated somewhat with our crowd, and I recall him as a jolly, good natured little fellow, and a great favorite with every one. But of this aggregation I came to know Lew Simmons best of all, and liked him for his unceasing jollity, exhibited in private as well as in public. The memory of my friendship with him is more closely treasured by me than any which I formed during this giddy and delirious period.

One of our favorite means of recreation during the daytime was a drive in our famous carriage through Fairmount park, where we vied in conspicuousness with the elite of the city; in fact, attracted more attention than the most of them. Our faces were familiar at many of the road houses surrounding Philadelphia at that time, where we distributed liberal patronage. Generally after these drives we would wind up at the Girard House in the evening in a "highly seasoned" condition. Naturally, at this time memory of places and dates is somewhat dimmed, and would be, even if I had at that time kept my vision entirely clear, but as it was considerably blurred by alcoholic methods, it is not surprising that I do not retain anything more than a faint recollection, extending in many instances not beyond the fact that Phiadelphia was on the map, and I was mixed up in it somewhere.

I have often regretted that I did not keep a record of places, occurrences and dates, but the thought never entered my mind that I was making any kind of history, and, anyway, I was too busy to attend to it. Never did I for a moment realize that I was achieving a notoriety that some day would be widespread, and that my name would be one to be conjured with by special writers and paragraphers for a generation. But one of my chief regrets at overlooking the importance of such a record is that I have forgotten the name of the house and its proprietor where the specialty on the bill of fare was the prosaic sounding dish of "catfish and waffles." I recall that it was a road house somewhere in the vicinity of Philadelphia, and on an average of once a week we would visit it and regale our appetites with these delectable viands. It is providential that time dims the vision to many things of the past, but today I would thank my stars if I could publicly pay tribute to the name of the man who served catfish and waffles as the leading feature of his bill of fare. I ate them until I broke out with a rash, gorged myself near to bursting and never grew tired of the diet. Syrup I had long ago given the goby, and I did not regain my youthful liking for it, but I never grew weary of the fish and waffle mixture. These feasts stand out in glaring spots on the memory of that hazy and delirious period. The catfish is the most delicious morsel that swims our waters, not much to look at, perhaps, but in the hands of the caterer he becomes a thing of beauty and a joy forever.

A Philadelphian who attached himself to our crowd at this time, through an acquaintanceship he had formed with Slocum, was George Brotherton, who, besides being one of the handsomest and most stylishly dressmen I had ever known, was an expert and nervy wooer of fortune with cards. In fact, he was an adept at every game of chance played in America at that day. Possessing a pleasing manner and the bearing of a gentleman, I became attracted to him and liked him first rate. In every sense of the word he was a better fellow than Slocum and filled with more manly instincts, in spite of the calling to which he claimed alle-

NITRO-GLYCERIN ACCIDENT



HAULING A BOILER BY NATIVE COOLIES TO THE WELL IN BACKGROUND

At Yengenyat, Upper Burmah, East India



DRILLING WELL AT YENGENYAT, UPPER BURMAH, EAST INDIA

In the foreground, native casing gang and boiler-men of India, in background, American officials and drillers



EAST INDIA BUNGALOW OR HOUSE NEAR BURMAH, INDIA

MEN IN THE FOREGROUND ARE AMERICAN OFFICIALS OF THE BURMAH OIL COMPANY. JOHN ROBINSON, SUPERINTENDENT, CARL B. JACOBS, GENERAL FIELD MANAGER, FRANK SEIPEL, FIELD FOREMAN, C. B. MCLAFFERTY, DRILLER



THE OIL CITY OF BAKU, RUSSIA.



OIL WELLS AT BAKU, RUSSIA.



THE ASUDULUEFF WELL, THE LARGEST IN THE WORLD, PRODUCED 150,000 BARRELS A DAY.



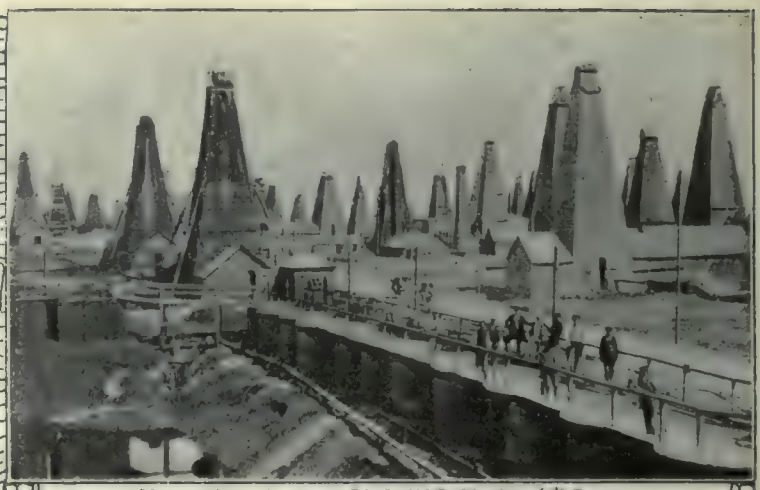
THE DOCKS AT BAKU, RUSSIA.



THE OIL REFINERY AT BLACKTOWN, RUSSIA.



A CAUCASIAN "HORSELESS" VEHICLE
BAKU. RUSSIA.



OIL WELLS AT BALAKHANI. RUSSIA.



THE IMPERIAL RUSSIAN PIPE LINE ALONG
THE TRANSCAUCASIA RAILWAY IN RUSSIA



TWO MEANS OF TRANSPORTING OIL IN
RUSSIA—TANK CARS AND CAMELS.



PIPE LINE PUMP STATION NEAR BAKU RUSSIA.



THE MARKET PLACE AT BAKU RUSSIA.



FIRE-WORSHIPPERS TEMPLE

Built and Used By the Fireworshippers of India Because of the Perpetual Natural Gas Fire Which has Burned for Centuries



THE ASUDULUEFF OIL WELL AT BAKU, RUSSIA

THE LARGEST PRODUCING OIL WELL EVER STRUCK IN THE WORLD. IT PRODUCED 1,000,000 POODS OR 150,000 BARRELS OF OIL A DAY WHEN FIRST STRUCK. NOBEL BROTHERS, OWNERS

130



CAMELS OUTSIDE THE WALL AT BAKU, RUSSIA

READY TO RECEIVE THEIR CARGO OF OIL BEFORE LEAVING WITH THE CARAVAN FOR THE DESERT



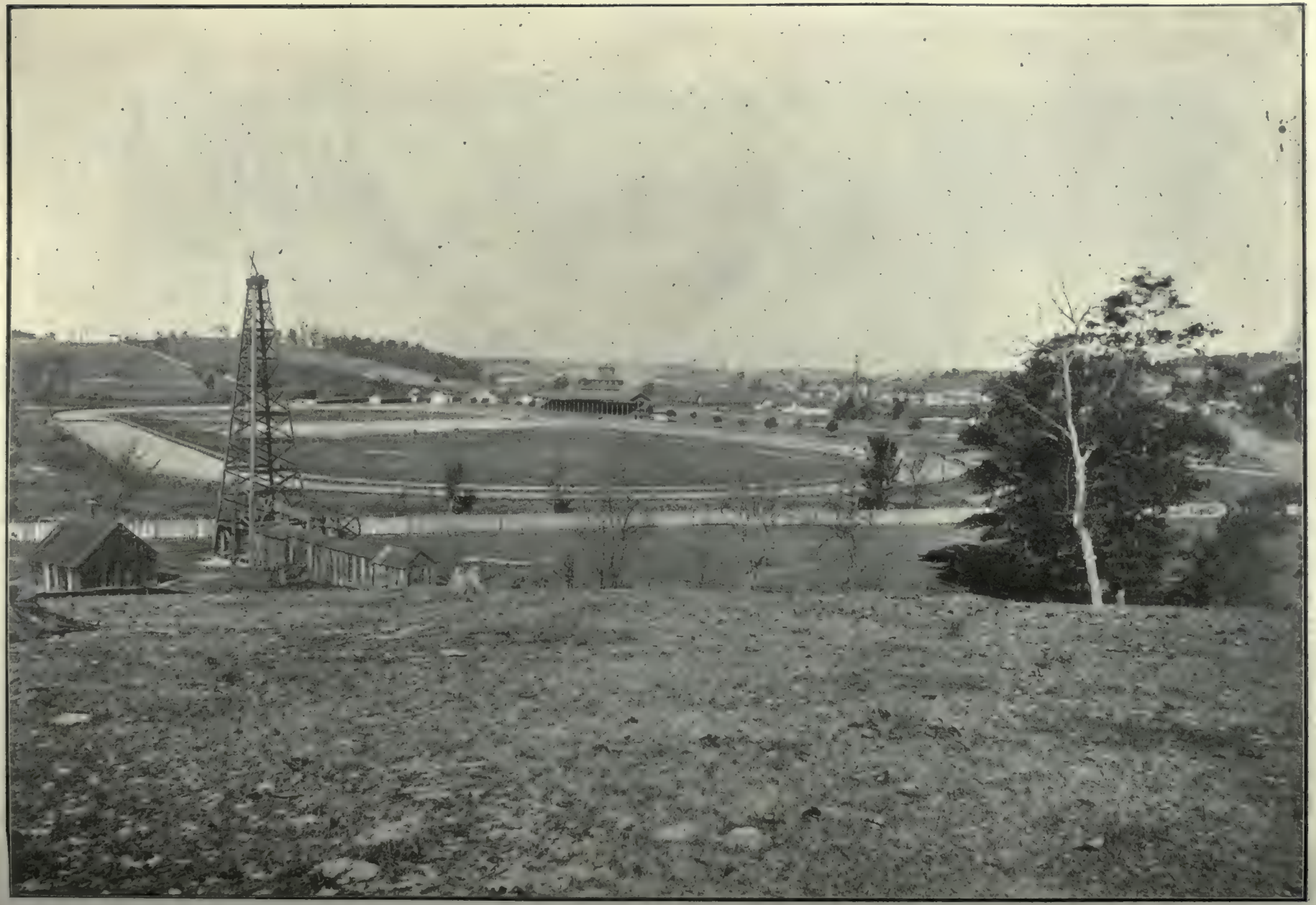
THE CITY HARBOR AND WALLS OF BAKU, RUSSIA



OIL REFINERY, BAKU, RUSSIA



TANK CARS AND OIL REFINERY, BAKU, RUSSIA



OIL WELLS AND FAIR GROUNDS (1887), WASHINGTON, PA.



SOUTH PENN OIL COMPANY'S TOOL HOUSE

McDONALD DISTRICT, MIDLAND DIVISION, McDONALD OIL FIELD, McDONALD, PA.



DUNKARD SAND OIL FIELD (NEAR) DAVISTOWN, GREEN COUNTY, PA.

giance. It takes a bright man to become even fairly successful as a gambler, and Brotherton had a knowledge of men and the ways of the world which would have brought him success in life had he chosen a legitimate occupation. He was a partner, although largely a silent one, in an all night saloon in Philadelphia which drove a thriving trade in wet goods, and to which place we often resorted to slake our ever-recurring thirst, especially when our finances became temporarily depressed, for there our names would accommodatingly be written down "upon the slate." Brotherton made a great deal of money by gambling, but spent it just as freely, and as a result of such a condition was often in a state of financial collapse. Consequently he knew how to sympathize with others who would occasionally go broke and come to their assistance when in his power to do so.

I recall that at one time I was walking with him along the street he mentioned the fact that there was a first rate faro game being dealt in rooms near by and he confided to me that he felt an inward "hunch" that he could play to win, but that unfortunately he was temporarily out of funds. At that particular moment I was in straits for the long green myself, but glancing across the street and seeing a pawnshop, I went over and put up my gold watch for $20, the amount Brotherton said he needed. I handed the money to him and together we went to the rooms, he to play and I to watch the game. Fortune did not smile upon the player till he was reduced to the last dollar of the twenty. But with that dollar the "hunch" seemed to get in its work, for Brotherton called the last turn on the deal, and received four for one. He then began to win steadily, more rapidly than he had lost, and in half an hour from the turning point he quit the game a thousand dollars to the good. The watch was relieved from its imprisonment, restored to my pocket, and we went out to spend the winnings, which we succeeded in doing in the most approved style.

The loud, rowdy and spendthrift ways of my erstwhile self-appointed guardian and authorized agent were well known, and coupled with outlandish reports of great wealth which had come to me, jewelers, tailors and other dealers were led to send in bills many times larger than they actually should have been, and once seeing them paid without protest the next time would add a little more commission. In this manner much money was foolishly paid out, which, had I used ordinary business caution and placed less faith in Slocum, would have been saved.

Ours was a riotous, feverish life, with scarcely a sober moment, and to a large extent we knew not what we did, and did not seem to care. The fool killer favored us by remaining religiously away at this particular period, and diamonds bedecked the persons of those who would not have been so favored had we not been allowed to live.

No one was allowed by Slocum to approach me whom he thought could possibly render me such service as would imperil the good time he was having at my expense. No one borrowed money from me at this time unless it happened to be a friend of his; and the crowd which surrounded me consisted largely of actors, men about town, so-called, gamblers and young fellows whose only occupation seemed to be to spend the money left them by some saving and economical ancestor. There were also adventurers hanging around, who looked upon me at all times as a lamb well worth shearing. Every one who stopped at the Girard House tried to get a glimpse of me, and it sometimes seemed a slice of my roll, and I was pointed out to the curious as the "oil prince" who was creating the sensation of the hour in his own peculiar way. At first I shrank from this curiosity, but afterwards got so I did not care, and with a cigar in my mouth, with diamonds sparkling on my shirt front and on my fingers I would march up and down the corridors, the cynosure of admiring eyes. The help of the hotel would jump at my word, for I was always lavish with my tips for the most trivial service. Therefore, by outward appearance, at least, I fully justified many of the inferences drawn of me at that time. Never had I known before what it was to be surrounded by a crowd of flatterers and I was not sufficiently acute to detect the reason or to pick out the sycaphants. Consequently I was placed upon a pedestal and worshipped for what there was in it, and in return for flattering praises spent my money freely upon my admirers.

As I have stated, I drank a great deal. Whiskey more strongly appealed to my appetite than any other liquor, and finding this appetite harder to appease as time went on, I contributed largely towards the revenues of the government. Money went freely through my hands, still more freely through Slocum's, and in that brief six months of delirium in Philadelphia and other cities, I lived longer than in all the balance of my time on earth.

Occasionally some old friend from the oil country would visit me, when I would consider it my bounden duty to extend to him the kind of hospitality for which I was becoming celebrated. What such a one told when he got home I do not know, but if he told the truth, tales were related at oil country firesides such as were never listened to before.

What is the gait of Philadelphia today among the class of people with whom we associated I do not know, but at that time they stayed out later at night and traveled swifter than the Quakers, and their manners were such as would have blackballed them for admission into the Society of Friends. The city, as were many other cities at that time, was filled with strangers owing to the great war then being waged. Palaces of sin were in full blast and in many quarters the clinking of glasses, the maudlin songs, the shrieks of siren and masculine laughter could be heard throughout the night.

Gambling resorts were numerous, where unwary lambs were parted from their fleece; but I did not part with mine by this method. Certain writers have stated that I lost thousands of dollars by the turn of a card, while the truth is I never played for money in my life. However, my chances for doing so were unlimited. I consorted with gamblers to some extent, and frequented gambling rooms; but while urgent invitations were extended to me to woo fickle fortune in this manner, I refused to do so ,arguing that I preferred

to spend my money in a way which would be more productive of enjoyment to a man of my tastes. I have often regretted that my refusal did not extend to other invitations, the acceptance of which proved detrimental and contributed to my final undoing.

However, it might be stated that I spent enough money at the Girard House, or was charged with having spent enough to have purchased a controlling interest in a first class hotel. When leaving there the proprietor presented me with a bill for myself and Slocum of $19,000. Considering the fact that I paid him large amounts at various times, I naturally wondered how it could be so large. Yet, assuming it to be correct, I figured that our bill at this one house alone for the six months in Philadelphia exceeded $25,000. This speaks louder of our career in the Quaker City than anything else I can mention.

The only "time" I ever had at the Continental Hotel was in that part reserved for the dispensing of liquid refreshments. As has been noticed by every one, intoxication develops strange characteristics in individuals. A surly man will be changed into the most genial soul in the world, while the man who in sober life is the incarnation of geniality will be converted into the most offensive belligerant, and want to fight everybody he meets. Some, with no music in their souls, will break out in song and the clumsiest will insist on tripping the light fantastic toe. When I reached a certain stage my nature took on the hat smashing mania, and I tried or wanted to smash every high hat that came to my notice. One night I was with a party of friends at the Continental bar. It happened that we all wore high hats, and it also happened that while we were drinking and swearing eternal fealty my mania asserted itself. Seizing a cane I rapped the hat of the fellow next to me down over his eyes. This seemed so funny that I jammed the hat of another fellaw so hard that it completely covered his face, and he was pulled out with considerable trouble. By this time all of the crowd entered into the spirit of the thing. One of them struck at my hat, and thinking to fool him I removed it just in time to catch his cane on my head in the most emphatic manner. For some reason or other the crowd seemed to think the joke was on me. When we had finished we possessed a collection of the most dilapidated looking dicers ever seen, and resembled a group of shabby genteel wrecks. But we stayed in the bar until it was reported dry. The next day I purchased a new $8 hat for each one of the crowd. The foregoing escapade, of course, attracted attention, and possibly from it originated the Ananias story of the purchase of the hotel. I only purchased the liquor. It reminds me of the little line reading,

"Tall aches from little toe-corns grow."

So many demands were made upon me for loans of money from all sections of the country, both personally and by mail that I soon became hardened to them, and refused all applicants point blank, except in the case of a few personal friends, who sought temporary loans. To the latter I always responded favorably when I could, but in many instances I found my confidence misplaced. To have responded to all my mail would have required a large force of clerks. When any one came in person for a loan I listened to their tale of woe and acted according to the best judgment I happened to have with me at the time.

Among those who came to me with schemes which afforded me an opportunity to invest my money were Low Gaylord and M. T. Skiff (the boys called him "Empty" Skiff), minstrel men, who had been conducting an organization under the title of Skiff and Gaylord's minstrels, and which after running through a season of hard luck, had become stranded. They were filled with a desire to get once again upon their feet, and therefore the appeal to me for financial assistance.

To one who viewed the stage with the liking I did the proposition made by them proved attractive and appealed to me strongly. Consequently Slocum and I agreed to take a half interest, but as the former had no money which was not mine, half of the show really belonged to me. Skiff and Gaylord owned the costumes and other material that goes with a burnt cork aggregation, but money was required to reorganize and rehearse a company, and to put out new advertising With the money I furnished wood cuts were purchased and bills printed which set forth in glaring letters and in flattering terms the merits of the show. One of the large posters had a picture of Slocum and myself in the upper left and right hand corners, respectively, while in the lower corners appeared the pictures of Skiff and Gaylord.

The company was soon organized, placed in rehearsal, the advance agent started out upon the road and the show moved up into New Jersey to win shekels and gather up a bunch of fame.

It was a good show, as many who saw it at the time will testify. Skiff was interlocutor, while Gaylord played the bones and Hughey Dougherty the tambo. At the present time I do not recall the names of all the performers who, including the band, numbered about 20 people, but among the crowd were Delehanty and Ward, a fine double clog team, and Joe Maires, the best female impersonator I ever saw. The leader of the band was a little Dutchman by the name of Buckholz, who was certainly an artist. But the great fun maker of the aggregation was Dougherty, who in his time has made thousands of people laugh at his original and irresistible humor. At this time he was a young man, just rising in his calling. He took to the business like a duck to water, and his constant comicalities off the stage were as amusing as those he sprung behind the footlights. His fun was of that spontaneous kind which made him appear to do and say the right thing at the right time, and he was very apt at hitting off popular fads and follies as they appeared. He was a good dancer, and one night, feeling in a particularly happy condition, he danced for 35 minutes, until he was dripping with perspiration and the orchestra had become exhausted. Whenever the musicians would show any inclination to stop, he would spur them on. The audience became uproarious and urged the contestants to further effort. Another of Dougherty's acts was a stump speech, the delivery of which always convulsed the hearers. He appeared dressed in the burlesque style of an old fashioned colored preacher, wearing a high hat of ancient mintage, a long coat and carrying a large umbrella. Each night the speech would be varied to suit local conditions or

national happenings and was as much enjoyed by his colleagues as by the audience. Walking up to the table in the center of the stage he would place his hat upon it, and as he proceeded with his remarks he would gradually work himself up to a state of feigned earnestness and excitement. Then he would raise his umbrella ostensibly to bring it down upon the table to emphasize his remarks, and miss the table, which miscalculation would appear to throw him off his balance and compel him to turn a complete somersault in order to regain his equlibrium. Excusing himself to the audience for his undignified action, he would proceed with his remarks, slowly at first, and then gradually work himself up to another pitch of excitement, when he would bring his umbrella down upon his hat with a violence sufficient to smash it flat. Picking it up he would look at the wreck so ludicrously that his audience would shriek with laughter; and although I saw him do this many times, it always drew a smile from me. Dougherty certainly was one of the smartest men in the business, and when I saw him last he was still maintaining his reputation for jollity, although an old man then.

Slocum and I did not appear in the performance, but confined our duties to the taking and selling of tickets, and marching with our partners at the head of the daily parade. As I marched to the stirring notes of the band ,dressed in the regulation high hat, long coat and carrying a cane, while diamonds sparkled upon my necktie and upon my fingers, for the time being I was oblivious of everything else, and secretly thought I was one of the great moguls of the earth, whom ordinary mortals would be more than pleased to fall down and worship.

The aggregation started from the Quaker City in good style and spirits, and played up through New Jersey to good houses. Slocum and I stayed with them for a week, showed them a good time whenever opportunity presented, and opportunities were plentiful. It was a howling, whirling week. Our ordinary expenses were paid out of the funds which came from the treasury, and this was the only financial benefit we ever received from the venture. The extraordinary expenses, a much larger sum, I paid myself, and thought all the while I was having a jolly good time. However, we did not drink champagne, some accounts to the contrary notwithstanding. I began my "spiritual" education on whiskey, and when one becomes thoroughly addicted to that habit every other drink seems mild and tame in comparison.

So while the merry minstrel men went their happy way, my partner and myself besought once more the quiet precints of Philadelphia.

While my partner and myself clung closely to our adopted city of Philadelphia, we frequently varied our life by a trip to adjoining towns. The cities of Washington, Baltimore, Cleveland and New York and many others were favored financially by visits from us, for in each of these places we strove to part from some of our "unearned increment." But we never stayed for any great length of time away from our Quaker City haunts. In that place we had friends, such as they were, and the people having become accustomed to our rough and rowdy ways, did not gaze at us with the curiosity that met us at other places. Another evidence of fame that came to me at this time was a letter from a circus man, in which he held out glittering inducements to me to travel with his combination exhibit myself as a sort of freak. I treated the offer, however, with all the scorn I could muster and informed him that I was engaged in running a little show of my own, which in certain ways at least, was a complete and howling success. I had no desire to sit by the side of the fat lady or the tattooed man and be pointed out as the untamed rooster from the oil regions.

When Slocum and myself had carried out most of the foolish ideas which we had been able to conjure up, we cudgeled our brains for something new. We did not want to feel stale. Therefore in one of our fits of idocy we decided that two young men of our tendencies should branch out into the horse racing business. Slocum was the first to broach the idea, and I was so much elated over it that I invited him to a continuance performance at the bar. We decided that no common scrub would suffice for us; we must have a horse that would make all others resemble " 30 cents" as he would trot down the home stretch; an animal that would make his owners famous wherever the trotting horse was known. And the race track, which had heretofore only recognized us as gay and festive spectators, should now look upon us as important factors in the racing annals of the country.

Therefore I started out to find an animal that would answer our expectations. As soon as people found out what I was after I was offered all kinds of bargains in the horse line, in the shape of "comers," "wasers," et cetera, but I informed every one that I was looking for an "iser." As I was in a condition that would as likely lead me to buy a saw-horse as a sure enough equine of flesh and blood, I was liable to be misled; but at last I found a horse that seemed to please my fancy. It had always been a sort of belief of mine that I could tell by looking at a horse's ears the kind of a disposition he possessed. But I must say that this animal upset all my notions of horse physiognomy completely. He had a sort of melting look which seemed to imply that he would do his best under all circumstances, in fact an animal that one could tie to. I afterwards found that this was true to the extent that anything that horse was tied to was perfectly safe. His was not a disturbing disposition. He was guaranteed sound of wind and limb, and this was true. He certainly had all the wind capacity which his speed called for.

We purchased him and placed him in the hands of a trainer out at the race track, to whom we afterwards referred to as "'our trainer," and he grew an inch every time we did so. The horse was a pacer, but I have forgotten his name. I started out deliberately to do so after the first race.

Having placed him in the hands of "our trainer," Slocum and I visited the track at Point Breeze almost every day to see him go. We were all wrapped up in him. All by himself he could go, or seemed to go, faster than any horse we had ever seen. Therefore we entered him in races and lived in great anticipation of the events. In our minds we could see him come thundering down the track and covering us with fame

and his driver with mud at one and the same time. However, it came to pass that the horse could go fast enough by himself, but in the company of others he developed a shrinking disposition—shirking, Slocum called it. With other animals around he appeared exclusive and backward—way backward. He would retire within himself when most was expected of him. If the driver had been aware of this, he kept it to himself. From his standpoint it would have been poor finance for him to have given it away.

On the evening preceding the race we went out to take a final look at our pet; saw to it that he was properly blanketed and bandaged; and we drove home with pleasant anticipations for the morrow. Our driver was confident, the horse seemed so, and consequently so were we. We returned to the city, toasted the horse for several hours and retired to dream horse dreams.

On the afternoon of the race Slocum drove one of the horses which we owned to a road wagon, and I hitched the other one of the team to a sulky. I must have created a sensation. To see a fellow wearing a high hat, sitting in a sulky, smoking a cigar and driving along the street, must have been an edifying spectacle to those who witnessed it, a sort of reminder of the eternal fitness of things. But I wanted to appear sporty that day, and I was not at all disappointed with myself.

There was a large crowd at the track, and Slocum and I congratulated ourselves that so many had come out to see our horse. Slocum at first, in his enthusiasm suggested that we treat the whole crowd, but I finally compromised with him by asking him to take a drink with me. Our driver told us that he was confident the horse would make a record for himself—and he certainly did.

The time for "our race" arrived finally. As certain horses would appear, they would be cheered by their admirers. When our pet trotted out, or paced out, the crowd seemed stunned, for no sound was heard except the hip-hooray emitted by Slocum and myself, at which some of the crowd started and others laughed. I did not know why then.

But soon they were off, with our horse right up in the bunch as far as the quarter pole, at which place he seemed to withdraw from the bunch, or possibly, more properly speaking, the bunch left him. His old exclusive habit overcame him, and he showed his preference for going along by himself instead of in the company of third-raters. It would have pleased us better, however, if he had withdrawn from the bunch the other way, and gone ahead of it. But what could one expect, any way, from a strong minded horse, with such an individuality as he had? The more the driver urged, the haughtier he became, and the truth is, he was hustling to get inside the distance flag just as the band was getting ready to play "Hail to the Chief," or something else in honor of a third-rater that was about to push his nose under the wire. My partner and I, respecting the disposition shown by our horse, never entered him in another race.

Driving home from the races in those days was a thrilling and dangerous event, a sort of free-for-all contest between all kinds of horses, attached to all sorts of vehicles, and driven by all sorts of drivers, all spurred by an ambition to get ahead, even if they had to run their animals. Feeling somewhat disappointed with my track experience and somewhat exhilirated by the liquid consolation which I had absorbed, I resolved to beat that crowd up the road or die in the attempt. My horse seemed to catch my spirit, and for a time our efforts seemed crowned with success, but just at that time my sulky collided with another vehicle, and my expectations and myself took a drop. When I came to my senses a few moments later I was lying in the gutter, with my vision cast skyward, with the skin shy from one side of my face, and the horse and sulky missing. Also on arising I discovered that my left leg had become slightly warped, although I soon got it straightened out to its accustomed length. A leg that had been pulled as mine had could not, in the nature of things, stay warped very long by a little thing like a collision. I also dared to hope that some one had stolen the horse, for in that brief afternoon I had become disgusted with the whole equine family.

Gathering myself together I boarded a street car and set the passengers in consternation by my appearance. My stovepipe hat resembled an accordeon, and I resembled one who had gotten the worst of it in a stabbing affray. When I got to the city I found the horse calmy waiting for me at the barn, the proprietor wondering where he had left me and one wheel of the sulky. Our racing animal afterwards did business for a street car company, which I always considered a good joke on that corporation.

The agreement with Mr. Wickham, by the terms of which he was to have the use of my farm for six months at a rental of $30,000, which would apply as so much purchase money upon the sale of the farm to him for $1,200,000 dollars, providing I could make a clear deed of the land at the end of the rental period, went into effect about January 1, 1865. That is, under the foregoing arrangement he assumed entire charge of the farm at the time stated. I had received the $30,000. In talking over the transaction with him a little later in the day on which Wickham paid me the $30,000, he asked me to sign a note for that amount so as to secure him in case anything should turn up whereby he could not hold the farm for the full term. If at the end of six months the agreement was fulfilled the note was to be returned to me. Without waiting to see whether the contract would be fulfilled, he entered the note as a judgment against the farm on January 9, 1865, in the courts of Venango county. S. Q. Brown also entered the same judgment against my Meadville property about a month later. Through some private transaction between Wickham and Brown Brown came into possession of the note, and entered it as stated. Instead of recognizing the spirit of the agreement, Wickham proceeded upon the idea, I think, that the $30,000 was to be considered as a loan, which it was not, in any sense of the word. I do not wish to do any one injustice, but the whole affair looked to me then, and more particularly in the light of later years, like a scheme to wrest my property from me.

In February, 1865, Dan Fowler, my Meadville friend, visited me in Philadelphia and conveyed to me the news that a judgment had been entered against my Meadville property; also that I had not made all my

payments on the same as per my agreement with Horace Cullum. Fowler, too, had entered a judgment against my Meadville holdings for $6,000, for money he had loaned me. It is true that I had borrowed some money from him prior to my arrangement with Wickham and, in the confusion attendant upon my Philadelphia career, could not state the exact amount, though I never believed it equaled the amount of the judgment. He also entered the judgment against my oil farm in Venango county, and later entered another judgment of $20,000 against the farm, but for what reason I did not know then, and do not know today.

As stated, when Fowler visited me in Philadelphia in February, 1865, he brought me word that my payments in the transactions with Cullum had not been kept; and he also informed me of the judgments entered by himself and Brown. The news of this laxity in the matter of payments came to me as a surprise, and almost sobered me up. Later I ascertained that my agreement with Cullum had been kept, that my agent, William Blackstone, had attended to the payments, and today I have a receipt in my possession for all of them, amounting to $45,000, which represented my interest in the business block.

Fowler represented himself as a sort of angel of mercy. He pandered to my weaknesses and called old "John Barleycorn" in to assist him. He stated that I would never receive much, if anything, from the Meadville property, and that he thought it would soon be hopelessly beyond my control. In this he was right. He further stated that if I would deed the property over to him he would make me a present of $1,600, and if there should be anything left after the judgments were satisfied he would give me the benefit of it, and he thought he would probably be able to save something over and above what these amounted to.

Leaving Philadelphia, Fowler proceeded to Rouseville to see Mrs. Steele, and represented to her that he had purchased my Meadville property and asked for her signature to the deed. Possessing more sense than I had displayed, she hesitated about signing. He informed her that all my Meadville possessions were involved, and were bound to go out of our control, anyway; that he felt sorry because we had to lose so much property, and on account of that sympathy was willing to pay her $3,000 in return for her signature to the deed—a matter easy of granting, a mere trifle. The notary—I do not recall his name, but he must have been a close friend of Fowler's—interjected his opinion that, as Mrs. Steele was not of age, the fact of her signing the deed would really make no difference; but that she might as well sign the document, as it would be like finding money.

Thus misled, Mrs. Steele finally consented, signed the deed, although she stated to them she did not do so of her own free will, and Fowler and his man Friday went their way, carrying in their inside pocket half of a Meadville business block, a $10,000 residence, and the Barton farm.

Not hearing anything from Fowler after he was supposed to arrive home, a few weeks after the transaction I went to Meadville to see him. And while I succeeded in doing so, I found him an altogether different man in his actions toward me than formerly. He was now the possessor of my property, and he could not find time to talk to me. Witnessing this coldness, it began to dawn upon me that I had been duped. If I had had some one to advise me properly at the time, I am quite certain I could have compelled him to disgorge; but I was chary in seeking advice, for so far in my career it seemed as if every one was inclined to advise me wrong. So chagrined did I feel about being taken in in the above transaction, that I never said anything about it until the present.

Whether or not Fowler came to Philadelphia as a representative of Mr. Cullum, by whom he had theretofore been employed in selling barrels to the oil producers along Oil Creek, I do not know. Certainly while in Philadelphia, and in the transaction with Mrs. Steele, he so represented himslf, and the property was deeded to him. One fact, however, is indelibly impressed upon my memory, and that is, I met Fowler first in the month of March, when he was selling barrels along the creek, and that in February of the following year he owned $67,000 worth of what had been my property, for which I never received any return except the amount which he had loaned me and the $1,600 paid to me in Philadelphia. In addition there was the $3,000 paid to my wife at the time she signed the deed.

I am aware that the foregoing reflects rather harshly upon my mental condition at the time and upon my lack of comprehension of business matters. In fact, I was a regular bargain counter. Yet I am willing to allow my actions to stand in comparison with those of the people who handled the other end of the transactions.

Troubles, they say, never come singly, and when they started on me they seemed to flock. At the end of six months Wickham gave up the farm, claiming it had not produced enough oil to justify a purchase, although before this period I had so adjusted matters with Hamilton McClintock that I could offer a clear title to the property, and was in a position, upon receipt of the purchase price, to pay all judgments against my holdings. The withdrawal of Wickham, however, left me without resources, except to the extent that I could "raise the dust" myself by operating the farm. I am happy to say that, so far as possible, I paid my obligations; but the avalanche of judgments that rushed down upon me proved so heavy as to almost overwhelm and discourage me. Learning of my embarrassments, other creditors were not slow in rushing in. The correctness of the greater part of the amounts I have always questioned, but the creditors went upon the principle that, as long as the slaughtering had begun, they might as well make a complete job of it. In Philadelphia I owed four firms, besides a small balance upon my board bill at the Girard House. But this is what I got:

Henry Carnegie, proprietor of the hotel, entered a judgment of $19,000. I thought I had paid him nearly everything, but this bill brought to me the conclusion that I had not practiced the strict economy I should have done. They must have charged me for the air I breathed and then read the meter wrong. The four firms mentioned to enter judgments were J. E. Caldwell & Company, jewelers, for $5,000; Lewis Lado-

mus, jeweler, for $6,000; Charles Oakford & Company, tailors, $540; and last, but not least, Field & Collender, $1,500. In explanation of the latter. I would say some friend of Slocum's wanted to start a billiard room, and the latter, together with George Brotherton, went his security for the amount of $1,500, and the claim came upon me. As to the jewelry, I must confess that more people in the Quaker City were wearing diamonds and such than there were before we made our sensational entrance into the city. The greater part of the jewelry for which I received bills was gotten by my friends, and some of it found its way into pawn shops, and was sold below cost to raise money when finances were low. Gold at that time was worth $2.50, and diamonds in proportion. So it is evident that it took some money to deck our crowd out with this costly material.

Andrew McKnight also entered a judgment against me for $5,000. He took a lease on the farm before Mrs. McClintock died, drilled a well, which proved dry, and when the farm came into my possession he wanted me to pay him the money he had lost. This I refused to consider, and he entered judgment.

Disgusted with myself, discouraged and sick at heart, upon the advice of Major James Mackey, my agent, I turned the farm over to Mrs. Steele for whatever benefit she could derive from it. It was also upon his advice that Mrs. Steele sold the farm to Taylor, Mackey & Company for $20,000. Immediately following the purchase Judge William A. Galbraith, of Erie, Pa., entered up a judgment of $10,000 for legal services; Charles E. Taylor, of Franklin, entered two judgments, amounting to $12,500, and James Mackey a judgment for $5,000. I do not believe that any of these judgments were valid, and I did not owe any of the parties one cent, and the judgments were doubtless entered against the property to ward off others which might have been contemplated. Galbraith's claim was for legal services, but I had paid him all I owed him. I had never had any dealings with Charles E. Taylor up to that time, and Mackey's claim was for services rendered, I believe.

They took possession of the land in March, 1866, and ran it until January 1, 1867. After they had held it for this period (I was absent), Mrs. Steele insisted upon the purchase price. And although the farm had been held by them for nearly a year, all she realized from it was $6,000.

So the famous and much talked of oil farm passed out of our possession. If in my short, grotesque and foolish career as owner and proprietor I had been surrounded my men who had had my best interests at heart instead of by those who seemed to wish to profit by my weaknesses and innocence of legal procedure and business methods, circumstances might have been altered, and instead of being held up to the public in the light of a silly, unreasoning spendthrift, I would have been in possession of an ample fortune during my declining years.

During 1867 the farm was sold under the sheriff's hammer and was bid in by George W. Hinkle, of Philadelphia, for $35,000. It was afterwards controlled by a company, the shares of which were $100 each. It has passed through various hands, until today it is owned by Mr. John W. Waitz, of Oil City, who, by drilling upon the hillsides as well as along the banks of the creek, and adopting up-to-date methods in oil production, has once more converted it into one of the best paying properties along Oil Creek.

Through some kind provision of nature, the pleasantest of dreams often come to those whose daily lives are crowded full of trial and grief, and it is good that it is so, for in that brief forgetfulness of daily trials they find their only happiness on this big earth. The poor man in his hovel may dream of a palace, where everything is of the gold and glitter order, where every want may be granted simply for the asking, and where the care-furrowed brow is made smooth. However, such surcease from life's actualities is only temporary, and sometimes only serves to make the real existence more bitter. No matter whether the dreamer be a king lying upon his downy couch or the beggar resting upon a board, to each the awakening comes, the terrible realities of life again face them.

Today as I look back upon that period of my life when I might have accomplished so much good for myself and my friends, and accomplished nothing; when I think of the obligations of manhood placed upon me by reason of my family and friends, which I carelessly and thoughtlessly cast aside, to rush into and be engulfed by a vortex of dissipation, it seems as though it were a dream, so utterly impossible and inhuman does it appear to me now.

From the time I made the bargain with William H. Wickham in the Girard House of Philadelphia, by the terms of which he paid me $30,000, and held dangling before my eyes the promise of over a million dollars more in six months from that time, my feet trod the downward way, and at all times I was surrounded by those who were willing and ready to accompany me, so long as I paid the freight. I spent my money foolishly, recklessly, wickedly, gave it away without excuse; threw dollars to street urchins to see them scramble; tipped waiters with $5 and $10 bills; was intoxicated most of the time, and kept the crowd surrounding me usually in the same condition.

I seemed to forget the folks at home. The easiest thing in the world is to forget, even those things which should be kept in memory. Once or twice, however, I broke away from Philadelphia to go back to the old farm. Slocum accompanied me; another time Brotherton went along, at my expense, and we scattered wild oats on the way. I was sufficiently conscience stricken, however, that I did not want to see my wife; but I did talk to her once, and then she pleaded with me to forsake my evil ways before it was too late. I paid no attention to this at that time, for I went back to Philadelphia and resumed the usual course. Liquor can make a man sell his soul to the devil quicker than anything else on earth, and certainly at this time mine was going devilward as fast as it could. A good evidence of this is shown by my neglect of those who, although they could have justly cast me off, remained true, hoping that some day I would forsake my evil ways and companions and hold up my head among men. I am no temperance lecturer and never wrote an article on the subject in my life, but if some one were to ask me to pen a sentiment for

the benefit of young men who have to face the temptations of the world, I do not know of anything better to say than, "Tell the boys to drink water." Such a warning should be placed upon the walls of every household, so that the meaning of it would sink deep into the minds of the young.

Of course I consider it somewhat out of place that I should offer an excuse for making a fool of myself. A man is generally looked down upon for trying to apologize for something for which he is more to blame than any one else. When a man goes into a thing with his eyes open, generally he cuts a poor figure when he adopts the excuse that some one else is responsible for his condition. But when I started out I was new to the world with which I was to mingle. My early life had been surrounded by good Christian influences, and my footsteps guarded as carefully by my good Christian guardian as though I had been of her own flesh and blood. I loved my wife, I loved my boy, and yet I went the "pace that kills."

Already I have given some idea of the crowd that surrounded me in my Philadelphia life. Some names I have not mentioned, but it is because I have forgotten them. All I can recall is that they swore eternal fealty and friendship, clung to me while my money lasted, and forsook me when it was gone. These men were gamblers, men about town, actors, youths whom riches had pampered into a condition to make my kind of life attractive to them; business men whose motives were not of the best, and who should be classed with the sharpers whose methods were not always apparent to me because of my condition. Such was the following of courtiers who attended me, laughed when I laughed, drank when I drank, and at my expense; and by them I was flattered and fleeced. The pedestal upon which they placed me was so high that I seemed to look down into their expectant eyes and read in them admiration for my brightness, and I scattered favors in profusion. It was my prominence upon this pedestal also which made me such an easy mark.

While in this delirium rumors reached me that all was not well at home. Wickham, some one informed me, had not been doing right. To these things I paid but little attention, and continued on my giddy career. At the end of six months, I foolishly argued, I would be able to make a clear title to the property, and great wealth would be mine. So dull care was driven away, and I kept sailing along the same old rapids.

One day in the midst of the wild delirium a missive was handed me by the hotel clerk from W. A. Galbraith, which read that Wickham had given up the farm and James A. Mackey had been placed in charge as my agent. More than a million dollars gone in one dash. I tried to realize it all. The fortune on which I had been staking everything had disappeared like a flash. I called Slocum to me—Slocum, to whom in some wild drunken freak I had entrusted all; Slocum, who had always pretended to be my friend, and was friendly as long as I gave him money to spend. I needed his sympathy, and thought I had some right to it, but he had no sympathy or advice for me. He seemed willing to desert the ship. For the first time in a considerable period I became strictly sober, and for the first time in many, many days I thought of friends back home, of my good wife, who was now weighted with grief for me, and now had to confront this additional misfortune; and for the first time in my career of dissipation I did the manly and upright thing—I went to those who needed me.

At home I found things practically as they had been represented to me. Matters too long neglected had gone from bad to worse through the machinations of those who had taken advantage of my weakness. Looking at it in any way I could, the future seemed gloomy and dark. The farm, it is true, was left, but black clouds were hovering over it, and laden so heavily that, when the storm broke, it engulfed all.

Having now an occasional sober moment, I began to see Slocum in a different light and I resolved to get rid of him and Philadelphia at the same time. I shook the city first, however, reasoning that the only just and manly thing to do was to go back to the oil regions and save what could be saved from the wreck. Before leaving Philadelphia I did something which has gained for me a great deal of notoriety, and has been magnified so much that it has been told as happening in a number of cities, and in a manner which best suited the imagination of the writers who treated of the occurrence. I owed to the man who had the stable where I kept my team and carriage, and who acted as my driver, as well as my "chaperone" on certain state occasions, a nice little bill for his services. Having no money to give him and feeling under obligations to him for his arduous and faithful attention, I concluded to turn the horses, carriage, with its "coat of arms" and all over to him, and did so before I bade him farewell. I regretted I could not pay my other bills as easily as I did this one. That action led to many outlandish and exaggerated stories, which have had a tendency to lead readers to the conclusion that I gave away a team of horses and a carriage as a regular daily recreation.

My back was now turned upon Philadelphia. My friends, the courtiers of my flush days, had forsaken me and were seeking pastures new. My face was turned to the future, and the world looked cold enough. I was forsaken by all but one, and although she had been made to suffer more than all because of my misdeeds, she still believed in me and had faith that I would yet come out all right, and prove myself a man.

Two incidents of my brief and meteoric career have been touched upon in various newspaper articles meant to set forth some of my foolishness while I was playing the character of the champion spendthrift of the oil regions, and which had some, but exceedingly slight foundations of truth.

If some accounts are to be believed, I spent a large portion of my wealth and the major portion of my time in giving banquets to my friends. It is quite true that often at the Girard House I treated a friend to a dinner at my table, where I always displayed a great profusion of liberality, tipped the waiters up to the limit, and made them my staunch and steadfast friends; and therefore it is quite probable secured many delicacies from the kitchen which many a more deserving boarder did not get. But the only real banquet which I ever backed financially was one that Slocum and I gave to our minstrel friends of the silent-

dividend company of Skiff and Gaylord. At one time my companion and myself, being in New York on one of our excursions, heard that the merry crew was to play at Ithaca, New York, on a certain date, and we went up there, incidentally to gaze upon our investment, but more particularly to have a high old time. And we had it. We received a cordial greeting from our old friends of the burnt cork, and my gratitude for the same swelled to such proportions that I resolved to even up in some way. Possibly I argued that some day I would get it all back in dividends; but then, what was the matter of a few hundred dollars between friends. So I arranged with the proprietor of the hotel to set a banquet, to be pulled off after the show. It was a complete success. Beyond that I hardly recollect, and to describe the details of the feast is beyond me. Neither could I describe them accurately the next morning. I remember that some one nominated me for president of the United States, and that I accepted the nomination. Also I recall the fact of a biscuit hitting a merry minstrel man in the eye; also that some of the delegates went to sleep under the table. Tax my memory as I may I have no recollection of the manner in which the nominee for the presidency made his way from the banquet hall to his downy couch; but I do recall that the state of his feelings the next morning called for ice water in large doses. That was the only real, true banquet I ever gave. I think that was enough. From current report some people were led to believe that I spent most of my time in stocking special trains with drinkables, eatables, cigars, et cetera, and traveling with my friends about the country. This would doubtless have produced a lot of enjoyment, but I got mine in other ways.

The only special train I ever hired to run for me was not a train, but that essential portion thereof known as the engine. On one of our trips to the oil regions, Slocum and I decided to go to Erie, his home. Following a custom which he had acquired, we alighted from the train at a certain station to get a drink. We became so engrossed that the train very inconsiderately pulled out without us. This we considered as treatment entirely out of proportion to our rank, and we became somewhat indignant and wanted every one to know that we were not accustomed to such slights. and that a railroad or two was the most insignificant of all our possessions. In an effort to pacify our wounded feelings, the railroad people agreed to give us a special engine for the sum of $50 and catch the train for us, which they would hold up for 10 minutes at one of the stations ahead. They got the fifty, and got us to the train, where we arrived scared nearly sober and full of cinders. And that was the only excursion I ever backed in my life.

Having now bumped up against a great heap of adversity, as I have observed, I shook the soil of Philadelphia from my soles and started for the oil regions. Seth Slocum went with me. He had never left me from the first moment he had become acquainted. He did not wish any one to have a share of my wealth while he was on earth, and scarcely any one did, especially of the gilded circle, unless he himself was also a beneficiary. He clung to me closer than a brother could or would have done, and would have so clung to his dying day, no doubt, had my money held out. But on my last trip to Philadelphia I did something that I had not been indulging in theretofore, namely, I began to think; and the more I thought the more I became impressed with the idea if ever I was to amount to anything in the world, which I very much doubted, I must rid myself of Slocum. Every man is to a large extent what he makes of himself, and therefore, to a large extent should be held responsible. But I was confident that the influence which Slocum had exerted over me had not been beneficial, and I could see no good which could come to me by keeping him on my staff. Therefore I resolved to be rid of him as soon as I arrived home. I will give the fellow credit, however, for having a liking for me, but whether this was on account of any special characteristic beyond a willingness to part with my money to him, I do not know. But now my sober reflection told me that to get rid of him was the best thing I could do. I wanted to gain a foothold in the world somehow, and did not fancy the idea of being tripped up in so doing.

Therefore when we arrived at Franklin I informed Slocum that our partnership must be dissolved. For a moment he seemed to think I was joking, but I soon convinced him, for the first time in my life, of my earnestness, for I informed him that a memory of him would be more preferable than his presence; that no matter where he went, there I would not follow, and I did not intend he should follow me. He seemed dazed and bewildered at this statement of my intentions, or possibly at my firmness, as this was the first time I had ever shown any towards him, and for the first time in our experience positions were reversed and I was dictating terms to him. He begged, he entreated, he supplicated, but all to no purpose. My mind was made up, and for the first time in my life I felt the satisfaction which comes to one when he succeeds in casting a baneful influence to one side. The air I breathed seemed clearer, and more than that, I had the pleasant realization that I could assert myself on occasions if I wanted to, and take on some of the slight attributes of manhood.

When Slocum was spending my money, when he was surrounded by flatterers and fawners, and playing the role of a blustering spendthrift, he was the opposite of the man who on this day of parting pleaded with me for mercy and forgiveness. And even then I listened to his entreaty that he was a physical as well as a financial wreck, and gave him two notes of $2,500 each, he thinking that he might get something for them. And he did, for he sold the notes to John C. Porter, of Meadville, and they were afterwards entered against what was left of my property.

I had given Slocum everything he had ever asked me; had never refused him a favor. His will power seemed stronger than mine, and the foregoing proves that I had not yet gotten wholly rid of his influence. But after this transaction Seth Slocum went out of my life, and I breathed freer. I never saw him after that. He died in about two years after the time I parted from him. During his illness he sent word that he wanted to see me, but I did not go to him. If he wanted to explain anything, it was not necessary. He may have wanted forgiveness. He has that anyway.

I will not say that I was not as much to blame as Seth Slocum ever was.

With several hundred dollars in my pocket I started out. First I went to Rouseville and took a look over the old place. Then I went up to visit Petroleum Center, which at that time was in its glory as one of the toughest places on the footstool. And so I was again back in the old Oil Creek valley, but not at this time playing the character of the bedangled, diamond dedecked "Coal Oil Johnny" of yore, but practically stranded, estranged from my friends of former days, with plenty of people around to whom I could speak, but none who would advise or who offered to extend a helping hand. Now that I was down and comparatively penniless, no one fawned upon me. To all intents and purposes I was practically a wanderer on the face of the earth. One time I went back to the old church up there in the woods of Oakland township. Memories came to me of a barefoot, happy boy, of the honest, open hearted neighbors and of the good old people who had guided my youthful footsteps and tried to start me right in the world. It seemed to me as though I was driven instinctively to the old church to pay a penance, to give away to bitter feelings, to confess that I had not lived as I should have lived, and ask forgiveness. The regrets which came to me at certain times I can never express. I realized that the life I had been living was but a rope of sand, and the problem set me for the future was one which I hardly dared to solve. Fully realizing that drink had been the principal cause of my undoing, I made many a fight against it, and many times I lost before I conquered.

As I have stated, I visited Petroleum Cented. Like all the early oil towns it had been built in a hurry, and possessed board shanties, hotels, places of amusement, and muddy streets. But for pure, unadulterated wickedness it eclipsed any town I had ever favored with my presence, and I had witnessed the seamy side of life in many cities. For open, flaunted vice and sin it laid over any other on the map. There was no city government, thugs carried matters with a high hand, resorts of a disreputable character flourished openly, and the unwary were fleeced right and left. The scenes enacted caused even old "rounders" to blush. It was not safe for a man to walk the streets at night alone. Sandbagging seemed to be a regularly recognized occupation, and murder quite an occasional one. Gambling did not run behind closed doors, and thousands of dollars changed hands over the green cloth. Pleased to get away with life, I went to Titusville, which was a lively, hustling town, which a capable municipal government had transformed into a place where, comparatively, law and order were not at a discount.

Speaking of oil towns, one must justly mention Rouseville, a place which had grown up on the old Buchanan farm, almost opposite my old farm. There was no settlement there when oil was first discovered along the creek, but now it was a bustling place, containing one or two good hotels, a theatre, several churches and a lot of inhabitants of that busy, cheery, hospitable kind so characteristic of the oil country then as now. Today Rouseville retains more of the typical architecture of the early oil regions times than any other place along Oil Creek, and like all other towns has had its tragedies and comedies incident to the excitement attending the surging rush for wealth in the oil country. The burning of the well where Henry R. Rouse and many others met their death was a scene which I witnessed.

Leaving Titusville I turned my steps toward the west, hoping, as many pilgrims before me, that fortune would at last smile upon me.

From Titusville I went to Cleveland, Ohio. While there I stopped at the Weddell House, and on the evening of my arrival visited the theatre. Somehow it became known to a few that I was in the city, and I was gaped at by curious individuals, and remarks reached my ears which were not intended for me to hear. On my way back to the hotel after the performance at the theatre I became suspicious of the actions of two men, thinking they had laid a conspiracy to part me from my money. However, I was not feeling in a mood to be sandbagged and spirited up some dark alley for the edification of a couple of crooks. What money I had with me I needed worse than I ever needed money before. So I took the middle of the street. They did not follow me there, and I arrived at the hotel without molestation. This was the nearest I ever come to being robbed in the old fashioned, approved way, and that may not have been as near as I mistrusted. To being robbed in the more genteel fashion I had not objected strenuously; but I did not wish to welcome any new departures. Having received in my brief career more notoriety than I ever desired, my inclination now was to seek rest and quiet, to get into places where I was not known, and procure some honest employment by which to live. But go where I would it seemed that my record had preceded me, with the result that soon after arrival I would become surrounded by what to me at this time was an undesirable crowd of curiosity mongers, who, whatever their intention, made my life a burden. Then I would move on to some other place, wishing for peace and quiet, with the usual result of being driven out. My nervous system was rendered more sensitive by articles which would appear in the newspapers, and they put me in a bad temper. My attempted refutations would not appear in print; so I stopped saying anything about myself, harbored bitter thoughts, kept on retreating, and came to regard humanity in general as my bitter enemy.

I went over to Buffalo from Cleveland, and ran into a coterie of friends who had known me when I was on the "firing line," and who insisted on making my stay pleasant and agreeable according to their ideas. I stood them off temporarily and in the night time I skipped. I stopped in many places after leaving the Bison City, but a short time thereafter I found myself in Kansas City looking for work, being really desirous of securing any honest occupation which would enable me to forget myself and become contented and happy once again. Certainly I thought this a worthy ambition, but no one seemed to share it with me, and often I became despondent yet I never reached that stage of insanity which brought me to a contemplation of suicide. What was of no account in this world would stand a mighty poor show in the next, I argued, and

if the world would try and put up with me I would do my level best to get along on the best terms I could with it. My mind at this time, too, often reverted to the happy days of the home on Oil Creek, and to the folks up there. Then would follow the thought of how things were, instead of what they might have been, of the wreck which had followed my wake, instead of what might have been there; and at these times I did what many another fool has done, partook of the cup that cheers, but which too often inebriates.

On the first morning after my arrival at Kansas City I started out for a walk, wishing to see some familiar face or hear the voice of a friend, when some behind me remarked:

"Well, I'll be darned."

"Well, I'll bet it isn't," chimed in another.

"Take your bet," argued the first voice.

I turned around and bumped right into my old minstrel friends and partners, Skiff and Gaylord.

I was as glad to see them as a hungry man is to eat. At that particular moment I realized how the Israelites felt when they clapped their eyes on the promised land. I stood there and shook their hands, we hugged each other, and raised high jinks, much to the edification of the onlookers.

My friends had heard of my misfortunes and now expressed genuine sympathy, the first I had listened to since the collapse. Their show was playing in the city at the time, and I found I was being advertised on the same old bills which I had paid for back in Philadelphia. To myself I argued that I was just as much a proprietor of the aggregation as I had ever been, and therefore when Skiff said, "Johnny you have been a good friend to us. Come along and travel with the show," the sun came out brighter than it had for a long time. We did not stick upon terms. My expenses were to be paid, and I was to take or sell the tickets.

So again I was embarked upon a minstrel career, this time, however, destined to last much longer than my previous one. While I had up to this time argued that the returns from my investment in minstrelsy had not been adequate for the money expended, never having received a cent, it now seemed to me that I was being generously compensated. To travel with a crowd of congenial companions, with the assurance of a good living, at least, during the winter, was certainly preferable to traveling alone when all was uncertainty.

We visited many of the principal western cities, among them Chicago, but while there I never tried to buy an opera house for a benefit performance, as reported. The show finally worked its way over into Canada, where we played in the leading towns, including the cities of Toronto and Montreal. I was the "freak" of the aggregation, of course, and "Coal Oil Johnny" was pointed out and stared at all along the line, for which I always held the advance agent largely responsible. I controlled my natural feeling of resentment on the ground that if it helped the show, it was all right. When with the minstrel company I did not object to being pointed out so strongly as when traveling by myself, as with the company one was more or less in the public eye, and therefore felt that something was due to the public for the privilege of living at its expense.

Leaving Canada, we went over into New York state, crossing at Ogdensburg, and played a number of towns in the eastern and central portions of the state. Thence we traveled up into Maine and down through a goodly portion of New England. "Is that Coal Oil Johnny? Wal, I swan!" was a common remark during this portion of our tour. Among a certain type of the New Englanders this expression never varied more than a word or two, and seemed as typical of the country as the rock-bound coasts and granite mountains.

I liked the New England people. There are many different types, generous, shrewd, and all hospitable. There is a quaintness in the speech of the rural type which attracts the stranger, and is as distinctive as the dialect of the south. And I could not help contrasting the solid New England yeomanry with the inhabitants of the old Oil Creek valley before the oil excitement disturbed them

There was one individual in New England whom I did not like, and I ran across him several times in my capacity as ticket gatherer for the show. He was the fellow who tried to beat down the price of admission. To have reduced the tariff one cent would have afforded him unbounded satisfaction. This particular individual is the one who gives New England people a reputation for closeness and parsimony which is undeserved.

However, one day during the trip through New England I received a letter asking me to come home and begin to live over again, and show my friends that I could be a man. After one has kept away from the home folks as long as I did and dreads to go back because of a realizing sense of the injuries he has wrought to their feelings by reason of the disgrace which he has brought upon them, and therefore has come to believe that home ties are broken beyond repair, such a missive touches the heart. I had left home discouraged, filled with a thousand regrets, and surrounded by circumstances which brought to me a feeling that I had forfeited all the friends that I had ever possessed back there. As a consequence I had gone out into the world, cast my lot among strangers in order to if possible forget. Many times in my wanderings I had felt that I must certainly have been obliterated, and perhaps justly, from the thoughts of those who held the warmest place in my memory. Then regrets would overwhelm me, and I would go forward in a reckless, careless way, hoping to banish all such thoughts from my mind, for they were as so many evil spirits, disturbing my sleeping and waking hours. I had received two or three messages from home urging me to lead a better life; and this I was earnestly trying to do; and while my efforts were not what they should have been, yet my life was one of complete sobriety and upright living in comparison with my record in the old Philadelphia days with Slocum.

An invitation to come home was not one which I expected, and it was some time before I could realize its full meaning. To expect full forgiveness by those I loved, and a complete restoration of their friendship was something I could not bring myself to realize,

so little did I consider I deserved such recognition. But here was the invitation.

I decided to accept it, and told my decision to my minstrel friends. The boys gathered around me at parting and expressed true regret. We had traveled many hundreds of miles together, and our minstrel family was a happy one. And with sadness in my heart at the parting, but with a glad realizaton that I was going home, I bade farewell to that happy, genial, merry minstrel crowd forever. Most of the boys have passed over the Great Divide, and their laughter is hushed forever from the ears of men. Some of them are still in the land of the living, and if any of them read this page, I want them to understand that I still possess a fond remembrance of those old days of 1866 and 1867, when we joked and laughed as we traveled the world together.

While I left the boys back there in New England with feelings of sorrow, I was happy in the fact that after all I had done, after all that had been said, after all the heart pangs and the heart burnings, forgiveness was written over the threshold, and I was going home.

When I arrived in the Oil Creek valley I went first to the house of my brother-in-law, who was living on the old farm in a new dwelling which had been erected there, near the old McClintock house, where my boyhood days had been spent. My father-in-law, at whose house my wife and boy were stopping, was living at Dempseytown, Venango county, several miles from our old home. I at first hesitated about going there, fearing I would not be welcome; then I reflected that the letter asking me to come was in my pocket. However, before I started, they heard I was back at the old place and I received a cordial invitation to come.

I can never forget my feelings as I approached the house. They were of doubt mingled with glad expectation of seeing those whom I loved, and yet whom I felt I had so heartlessly and thoughtlessly neglected. Finally I mustered up courage sufficient to knock at the door. It was opened by Mr. Moffitt, who gave me a cordial handclasp and asked me to walk in. And inside was my good wife and mother, with tears in their eyes, and, too, there was the lively youngster of a boy, who jumped around and clapped his hands with delight. Figuratively the fatted calf was killed for the returning and foolish prodigal. There was no word of reproach, no word of regret from that family circle. My welcome was true and hearty, and implied that I was to be considered in the future, if I so desired, as one of the household. In other words, I was "returned and no questions asked."

When one has gone wrong and his conscience rises in reproof at the wrong doing, as mine had often done, when one has been cast out upon the world and brings himself to the thought that those who loved him at one time will, or should, know him no more; until such time and then only will he enjoy to the fullest extent being again with those whom he loves, and appreciate the full forgiveness which can come from kind and loving hearts. And until such time arrives, he cannot ring down the curtain over the past and look with complacency toward the future.

The kindly interest and good will of other friends gave me added hope, and I felt ready now to go out and battle with the world in earnest. The happiest moments of my life were those that I spent at this time, as I sat at the fireside with my family and friends, where full forgiveness banished the reproach which might have justly been given to me. Mrs. Moffitt treated me as kindly and lovingly as though I had been her son. I was "her boy," as she often expressed it; and it has always been a gratification to me that in later years it was possible for me to be near her in her final illness, to make her last hours happy. Then there was my boy, a robust lad, with a fine healthy interest in everything going in the world and capable of asking more questions than any other youngster living. He was glad to have me home, too; possibly not so much because I was his father as that I had traveled about some, and could gratify his curiosity by answering a part of his questions, at least.

The fall and winter of 1867 I spent at my father-in-law's. The next spring he sold the farm and moved to one in Sugarcreek township, in Venango county, which I had purchased. My wife gave me enough money with which to purchase a team, and with it I assisted to move the belongings over to the new place and then assisted in the farming operations. My father-in-law and I worked hard and faithfully, and accomplished a great deal towards clearing land and putting the rest of it in good and paying condition.

In May of the year 1868, I took advantage of the bankruptcy law. Afterwards I regretted many times I did this, for many reasons, but the action was taken on the advice of a lawyer. It placed me in a position where it was impossible for me to contest any rights which I might have considered I still held in the property. The money represented by the Philadelphia judgments was the only amount which I honestly owed. Had I not followed the lawyer's advice it might have been possible for me to have proven the illegality of the other judgments, and paid the money owed to my honest creditors. Still, I can truthfully set forth and aver that, even in the condition in which I was now placed, I was far happier and better contented than when engaged in the gayer occupation of buying diamonds for myself and friends and spending many thousands.

It was during the summer of 1868 when Mrs. Steele, with the assistance of her father, succeeded in collecting $6,000 for the oil farm in the transaction by which it passed into the possession of Taylor, Mackey and Company. In the fall of 1868 I moved my family to Franklin, where I went to teaming. At that time Henry Cullum, a son of Horace Cullum, the gentleman with whom I had gone into partnership on the business block venture in Meadville, Pa., was conducting a barrel factory in Franklin, in the third ward. About the first job of teaming I secured was hauling stave bolts for him, and when the bill amounted to about $40 he failed and I never received a cent for my work. Although the amount was but a drop in the bucket compared with the sums I had parted with in

other transactions, I felt the loss more keenly than any I had ever experienced.

It was while in Franklin that I joined the Episcopal church. The rector of St. John's parish at that time took a kindly interest in me, which he has always retained, and for which I have always felt under the deepest obligations.

After working in Franklin for a year I went to Rouseville, in the fall of 1869, and there for some time followed the occupation of a teamster, receiving good prices for my work. Later I was offered and accepted a position in the depot under Mr. E. A. Keane, who was agent there. My duties, for which I received $60 per month, included the handling of baggage and freight, and the checking of the latter in and out. I received $10 a month more for extra services, and later, when the express office was put there, I received $10 additional for assisting in that department. It is needless to say that I was as busy as the traditional boy killing snakes. With my income I bought a home nearly opposite the depot. I rented my team out. I worked in the depot from six in the morning until eleven at night, sent my boy to school and kept myself in a comparatively happy frame of mind—happy because I was winning my way in the world, regaining the respect of my former neighbors and friends, and that, too, in sight of the old farm across the creek that had been such a factor in my life.

As old timers will remember, the Rouseville station at this time was a busy one, and Rouseville itself a lively community. A train was kept busy running between that town and Oil City, three miles below, transporting oil down and bringing coal back. The land around Rouseville had brought immense sums. Corning & Beers were offered $4,000,000 for the Smith farm, located up Cherry run, which they had originally purchased for $3,500 from a man who had secured it in a trade for a yoke of oxen. This is only given as an example of the numerous business investments which surrounded the busy little town.

When Mr. Keene, the station agent at Rouseville, resigned he was succeeded by a gentleman whose name I will omit, but who was known by every one as a ceaseless practical joker, but of the harmless kind. He was always causing uneasiness in some quarters. I recall that he tied a cannon firecracker under the chair of a clerk and soared that individual heavenward, and who came down cussing until the air was blue. We were afraid of answering his questions for fear of being "sold." As a consequence of this tendency for joking, every one was laying for the station master. One fellow filled a tin horn with flour, went to the depot and called the agent to the window. He pointed the horn at him, but the flour was packed so tight it could not be blown out. The agent took in the situation at a glance, reached down under the window, seized a small sack of flour, hit the old gentleman with it and sent him out of the depot looking like Jack Frost. A book coud be written of these pranks. They served to make our duties seem lighter.

While at Rouseville I was initiated as an Odd Fellow, and have always remained a member of that organization. I had not lived long at Rouseville, however, before I began to receive extended mention once more in the newspapers. They told of how I had reformed, of things I did, of things I did not do, each article being more exaggerated than the preceding one. It was at this time the story originated, which gained wide circulation, to the effect that one day when upon one of my sprees in Philadelphia, I had placed $10,000 on deposit in a certain bank, which fact I had completely forgotten upon my return to sobriety. In later years the bank officials located me and the money with interest was turned over to me. No one could have been more pleased than I had this been true, but unfortunately it was not. It may have originated from the fact of my keeping a large sum of money in the safe at the Girard House.

While living at Rouseville a gentleman came to me and offered me $5,000 to relate to him the principal details of my career so that he could write a history of it. This offer I refused, as I refused all others. I thought that possibly some day the public would be allowed to forget all about me. But it never has and as the years roll on the accounts become more and more exaggerated, and I have been compelled to get into print myself as a sort of self protection. I refused many offers to exhibit myself with theatrical aggregations. In later years I could have received a large amount for exhibiting myself at the centennial exposition in Philadelphia. I was hewing out a new course, breaking a fresh path, and saving my money. Of course I got chances to invest the money, and I did. Mr. James Bredin had an oil lease at Bredinsburg which he thought unusually promising and wished me to go into partnership with him and drill a well. I put $600 into this enterprise, the well proved dry, and thus went a good lot of money which I had worked long and hard to accumulate, and demonstrated that my lucky star was not getting in its work at influencing my career to the fullest extent. After nearly two years and a half at the depot, feeling dissatisfied and wishing to fit myself for something better, I withdrew after a period of the hardest work I ever performed in my life. But I had worked myself into the good favor of many people, and I felt recompensed, for they were good enough to come and take me by the hand and make me feel that I was, at least, some sort of a factor in the world. And I can say that during this period, when working 17 hours out of every 24, leading a sober life, and with wife and boy happy on my account, I first realized what a pleasure it was to take care of myself and family.

Leaving Rouseville in the fall of 1873, I went to Pittsburg, taking my family with me, my purpose being to try a course in the Iron City Business College, thinking it would further my chances of meeting with success in life.

I found Pittsburg a busier city than when I had visited it in company with Mr. Hayes a few years before, but in view of my experiences in the interim, it did not seem as large. Nor did I care so much for riding upon the street cars. However, I had a boy to whom this afforded much pleasure, and I often accompanied him. We were in Pittsburg four months, the time necessary to complete the course I was taking, and I have always believed I acquitted myself with credit as

a student. To see a fellow who had been through the experience I had calmly settle down to the life of a scholar, even in a business college, seemed almost a paradox to some people. My previous experience had been chiefly confined to one side of the ledger. Now I became acquainted with the other as well. I should have done this earlier in life.

We returned to Franklin in the spring of 1874. I tried to secure a position, and several men offered to assist me to that end. But I was not successful and became somewhat discouraged. The little city did not offer as many opportunities for advancement then as it does today. However, I did make a business move to the extent of putting some money in a meat market with my brother-in-law, but the venture did not pay and I withdrew.

I found the feeling of despondency creeping over me again. At times everything seemed to conspire against my getting a foothold. Surrounding me, too, were many who were acquaintances of long standing, and the invitations to drink became too frequent. So I concluded to seek pastures new and felt a deeper longing than ever to find some place where no one knew of my past career. Taking my family with me, I again turned westward. Before starting we had not fully determined upon our destination. But one day we left the train at Denison Iowa, and here I planted my flag with the resolve to go to work at any honest occupation I could get which would afford a living for us.

Denison is the county seat of Crawford county, Ia., and is located between the East and West Boyer rivers at the junction of the two streams.

Here we found the people warm hearted and generous, and so far as I knew, no one in the town was aware of my identity as "Coal Oil Johnny," although I went under my full name. We bought some lots and built a house, went to housekeeping, and then I looked around for something by which to earn a living. The first one to offer me employment was a Mr. Homer Darnell, who, as it happened, had relatives in Franklin, Pa. He employed many men, as he had a contract for building bridges for two counties, and he engaged me to drive a team and haul lumber for these structures. I went to work with a will and kept at this occupation steadily all through the first summer and until the cold weather came in the fall.

I had never since my return to sober life enjoyed myself so thoroughly as I did in this western town. No one but my family knew my identity, or if they did said nothing about it, and I was for a period protected from that prying curiosity which had always been so odious to me. Oftentimes my duties would take me for miles over the prairie, where there was not a building or a human being in sight; and out there in the solitude with nothing but the sky above and the ground beneath far away from the old world I had known, where no one could break in upon the silence and burden my mind with a thought of the cares and troubles of other days, I felt that I had many blessings to be thankful for. My work was hard, but I liked it, and I could contemplate the future with perfect serenity.

Of necessity our gang roughed it a good deal, slept where night would overtake us, and partook of any kind of food that was presented. This was always eaten with a relish.

As I have said, the people of the town were warm hearted and generous, so characteristic of the west. I recall that Mr. J. Fred Myers was the editor of the Review, a Republican weekly. I want to give him full credit for his kindness in an indirect way to me; for when my identity afterwards became known, and a new batch of exploits appeared in the papers of the larger cities, he never printed any of them in the pages of his bright little journal. And this was done by him without any request upon my part for him so to do.

In the fall of the year I secured a position as manager of the grocery department in a large department store, an establishment that sold everything that could possibly be needed, from pins to coffins. One of the partners was an Englishman, who had come to Denison to take an interest in the store, and from the time he became a partner it was a success. With him came one brother, and a friend who held a position as bookkeeper in the establishment. I refer to these people, not only because they were exceedingly friendly to me, but because they were Episcopalians. My wife and I belonging to this denomination, our little coterie concluded it would be a good thing to build a church in which we could worship according to our creed. Consequently we formed a little society, called upon other people whom we thought would be interested, and some who did not attend regularly any church. We got up a Sunday school and gathered in all the scholars we could find, many of them children who had never attended such a school, and made them welcome. We soon had a good attendance. The ladies formed an aid society and raised some money in that way. The work on the church was performed by different individuals in the congregation, and most of the work was done after regular business hours. One of the members, a carpenter, aided most efficiently. The structure was begun in April, and about Thanksgiving time the roof was completed. We all went to work with a will, and in order to keep down expenses the duties of the church were attended to by the different members. Two ladies were designated each week to sweep it. As I lived near the edifice, I attended to the fires. I was also elected as one of the vestrymen, in which capacity I served for about two years, when I was elected senior warden. I was never more interested in anything than to see that church a success, and it was a success, and its power of doing good gradually extended. Our first rector was a kindly old gentleman, who believed that one of the paramount duties of this world was in doing good to others. He made this his daily creed, and lived up to it. Those who live in the west know that a cyclone is no respector of a church more than of any other building. One day a cyclone came to Denison and lifted the little church off of its foundations. At a comparatively slight expense it was replaced. I recall that one of the contributors to this fund was the former rector of St. John's church at Franklin, Pa. Not only do I feel grateful for this contribution, but for many other acts showing an interest in my welfare. At one time when some misguided young man of wealth was parading under the name of "Coal Oil Johnny," and met his death

in a tragic manner, my obituary began to appear in the newspapers, together with a record of my life. At that time this rector took it upon himself to set at rest these misleading reports, and was kind enough to say that I was living the life of a respected and honored citizen in a western town and that most of the stories told of me could not be justified or sustained by actual facts. To this man I owe a great deal for putting me upon the way to a better life than I had ever known before I came under his kind and thoughtful influence.

Another man to whom I owe a debt of gratitude was Mr. Issachar Schofield, of Dunlap, Ia., a Quaker, who owned a flour and feed store in Denison. After serving 18 months in the department store I left to take charge of the Denison branch of Mr. Schofield's business. The latter was one of the squarest men I have ever met. He would rather have parted with his right arm than to have taken undue advantage of any one, and as a consequence he enjoyed great credit and patronage. Afterwards his Denison business was increased by adding a grain elevator, and I superintended all of the business connected with that. My son had been at school at Ames, Ia., for a year and coming home and anxious for something to do, I put him at work running the engine in the elevator for a time.

I say with some pride that during the entire period of my service with Mr. Schofield he never found one word of fault with the way I conducted matters. Affairs were handled honestly, and that satisfied him. Near us were large settlements of Swede and German farmers. The latter were our exclusive customers, and would trust us implicitly in the matter of weight and measurement of their grain. These farmers were thrifty. I remember one old German who had six pretty daughters, but no sons. The daughters worked on the farm, and they would assist their father in drawing the grain to market. They could handle the heavy sacks as easily as a man could have done. I remember they had rosy cheeks and the healthy complexions which an outdoor life gives.

I remained with Mr. Schofield until the fall of 1880, when he decided to go out of business. I would have purchased the Denison branch myself, but I found my health giving out. The dust of the elevator had proven injurious to my lungs, and I therefore felt it necessary to secure some other occupation. Never did I part from an employer with more regret than I did from this good old Quaker gentleman. He lived up to the golden rule, one of his mottoes being, "When buying grain, pay all you can for it; but do not pay so much that you will have to cheat your customer in weight."

In this connection I might say that, as a side issue, my employer permitted me to conduct a small coal yard on my own account.

A Franklin gentleman, who was then doing business in Sioux City, learning that I was in Denison, came down and paid me a visit. We were glad to see him, and would have been glad to see any one from the oil regions. However, in conversation with some of the people of Denison, he let drop the fact that I was the famous "Coal Oil Johnny" of newspaper notoriety, and this fact soon became known to every one in Denison. My place of residence soon became located and advertised by all the newspapers, after which I had an opportunity offered me of going to Chicago and entering a dime museum. Many other offers came to me from showmen. Yet, while my identity became known, it did not seem to make any difference in the actions of my Denison friends toward me, for they always treated myself and family kindly. Although the outlandish reports appeared in the public prints, they did not worry me as they did. My feelings towards the newspapers were not cordial, and when a Burlington Hawkeye man one day got into my house and asked for an interview I effectively fired him through the portal with the remark that if during my career I had killed half a dozen or so of his profession, my peace of mind would have been much greater.

Possibly I did not look at the matter in the right way; but when one has been hounded day and night by column after column of fabrication, and was afraid of walking along the street for fear of being pointed out as a freak; when he has seen his family suffer humiliation because of the lying propensities of some irresponsible space writer—until then he cannot comprehend the feelings which came over me.

I have had some very peculiar experiences with individuals who knew all about me and whose information was gathered from reading the reports which had been put in circulation. One in particular comes to my mind now, of a traveling man who came up from the depot with me one day in the bus. Learning that my name was Steele, he asked me if I had ever known "Coal Oil Johnny" Steele. I professed ignorance of such an individual, whereupon he informed me that he knew him at one time, was with him when he bought the Fifth Avenue hotel in New York city and rode all over the country with him on a special train. Whereupon I think I was justified in thinking that as a prevaricator that traveling man was something of what the boys called a "bird."

While in Denison I gave up the tobacco habit. I had always used the weed to excess, and was always chewing or smoking. It made me nervous, affected my health and I resolved to rid myself of the habit. My appetite left me, and for a long time after breaking off I could not sleep. It was one of the greatest trials I ever had, but I won, and with that habit went all the bad ones I ever had, and for 25 years I have not used tobacco in any form.

My health growing somewhat worse, we decided to move to Lincoln, Neb., where we could place our son in college. We lived in Lincoln during the winter of 1880 and 1881. I recall that it was an exceptional season. Snow is much scarcer in that part of the country than many of the people of the east imagine, and a snow storm was welcomed as a sort of a novelty; the citizens took advantage of the pleasures it afforded in peculiar ways. Improvised sleighs would appear upon the streets soon after a fall of snow, a familiar kind being made of dry goods boxes placed on runners. I remember one individual who hitched his horse to a rocking chair. It is needless to say that he was the chief attraction.

During the fall of 1881, my health having improved to an extent that would enable me to go to work, I secured a position in a general merchandise store in Kearney, Neb. A few months later my family follow-

ed me. In the summer of 1882, there being a vacancy in the freight department of the Burlington station, I decided to quit the mercantile business and return to my former occupation of railroading. After serving in this capacity for some time, I was made cashier and worked in this line until the spring of 1886.

Kearney was a lively little town at this time and was experiencing a real estate boom of considerable dimensions. I invested some money in this line and realized a good turn. At this time I also invested in some Nebraska land near Kearney. When I purchased it the nearest railroad station was 19 miles from it, but at the present time there is one railroad within two and a half and another within three and a half miles. I still own this land, rent it on shares, and it is gradually improving in value. Kearney was a great shipping place for cattle and the cowboys used to visit it. After a roundup these individuals would inject a little excitement into the life we lived there. They never did any great injury, but their fun was of a kind to scare a tenderfoot. They would ride their bronchos through the streets, fire revolvers in the air and emit whoops which would chill the blood of any one unused to such scenes. Another favorite amusement was to ride their ponies into a saloon and ask the bartender to hand them up a drink. When they had disposed of it they would turn the pony around, give a shout and ride out. Sometimes they would race their animals along the sidewalks, at which time all foot passengers discreetly got out of the way.

While at Kearney we had the pleasure of assisting to reorganize the Episcopal mission, which had been suspended for some time. We found a few families who entered into the work heartily, and we began holding service in a store building; later the services were held in the Christian church, and a Sunday school and ladies' auxiliary organized The bishop, seeing the needs of the place, sent a clergyman and furnished means to carry on the work. In about a year we had a nice little church edifice. From this small beginning it has grown to be one of the leading churches of the diocese.

Finding that the close confinement of the office did not agree with me, I made application for a change that would give me outside work. I was transferred to Louisville, Neb., and given charge of the yard. It was with sincere regrets that we left Kearney and the many kind friends we had made there. Louisville at that time was a busy little town of ten or twelve hundred inhabitants. There were to large stone quarries which were getting out about 75 cars of ballast daily for the Burlington railroad, and a large pottery manufactory. The country surrounding was given over to farming. We remained here about two years, when I was transferred to Ashland, Neb., a much larger town, about midway between Omaha and Lincoln. I remained here about ten years, when I was called east by the serious illness of a near relative, and our time has been divided between the east and my western home ever since.

The writer first met John W. Steele on March 4, 1903, at the corner of Liberty and West Park streets, Franklin, Pa., at which time an agreement was entered into for the publishing of a full and true history of his life, together with all the true information that could be gathered together. John W. Steele now makes his home with his father-in-law, Robert Moffitt, on rural route No. 3, Sugar Creek township, five miles north of Franklin, Pa. Mrs. Steele also makes her home with her father, while their son, Oscar Culbertson Steele, is located at Ashland, Nebraska, where he holds a responsible position with the Burlington railroad. John W. Steele is a very difficult man to interview, owing to the fact that he has been so often misrepresented through the newspapers and magazines. However, through the kindness of W. S. Whitaker, late editor of the Franklin Daily Leader, Smith & Co., news dealers, and other influential people of Franklin, Pa., the writer was enabled to make a date for an interview with Mr. Steele, at which time he found him a very courteous gentleman, and learned from him that he makes two or three trips to Franklin every week in a single buggy drawn by a small bay pacer horse, in company with his brother-in-law, Abe Moffitt. The horse is taken care of at W. B. Myers' livery stable, on Thirteenth street, while the men are in Franklin. After the writer had interviewed John W. Steele, he went to the old Culbertson McClintock farm, later the Johnny Steele farm, and now the John W. Waitz farm, at Rouseville, Pa. On the farm are three houses. C. Adam Waitz, brother of John W. Waitz, superintendent of the wells and farm, resides in the first house from Rouseville; John W. Waitz, sole owner of the Steele farm and wells, makes his home with his sister, Mrs. Austin J. Shanfelter, who resides in the second house; while David E. Tracy resides in the third house, which is better known as the Coal Oil Johnny Steele house. There are 62 wells on the farm, 26 on the flats and the remainder on the hill, operated and pumped by three powers, two gas engines and one water power. The water power was built by Armstrong and Hathaway, who had a millrace dug from Oil Creek on the upper end of the McClintock-Steele farm, now Waitz farm, through the farm to run their water power on their lease on the lower end of the farm on the flat. This makes the flat an island, with Oil Creek running around one side and the millrace on the other side of the 200 acres, which comprises the farm; 25 are on the flat, or creek botton land. In the early sixties no oil producer would think of drilling for oil on a hill, nor could he be induced to drill on level ground 500 feet from running water. All the first wells were drilled wet to the first and second sand and in a few years nearly all the old wells were abandoned. In a short time after John W. Waitz got full possession of the farm he began to drill over the old territory. One of the old holes was under the bull wheels of one of the wells he drilled and cased. This well started off at 35 barrels of oil a day, and another old hole was under the Sampson post of a well he had drilled, which started off at 25 barrels of oil a day, and later all of the wells were drilled to the third sand, which is 144 feet below the second sand, which is 500 feet below the surface, and 1,000 feet on the highest point on the hill. The present production of the farm is about 1,000 barrels of oil a month.

THE FRANKLIN, PENNSYLVANIA, LUBRICATING OIL DISTRICT.

JAMES EVANS,

The Pioneer Franklin, Pa., Lubricating Oil Operator.

James Evans was born near Morgantown, Va., (now West Virginia) in 1801. Mr. Evans while very young learned the blacksmith trade. Mr. Evans left Virginia (now West Virginia) in 1825, locating at Meadville, Pa., where he was employed at his trade until 1839, when he moved his family to the Evans homestead on Otter street, Franklin, Pa. It was on this property Mr. Evans drilled his first lubricating oil well in 1859. Mr. Evans died in 1875. The property is owned by the Evans heirs. This brief history of Mr. James Evans is given by authority of his son, Ralph Evans.

The Franklin lubricating oil district lies around and in the city of Franklin, and is made up, for the most part, by the territory lying between and including Point Hill, Patchen run and Two Mile run. The line or belt of the most important developments, is about one hundred rods wide, and so far as developed, two miles in length, and includes the following farms: Hyde and Blakely farm, Geo. P. Smith farm, McCalmont tract, Lamberton, Galloway, Dr. Fee, Fee, Kunkle & Co.'s farm, and D. Grimm farms.

Soon after the striking of the Drake well Mr. James Evans, a blacksmith by trade, drilled a well on the lot on which he resided, within the borough limits. The well was put down at first for the purpose of obtaining water, and at the depth of 17 feet a vein of water was struck, which soon became covered with a thick scum of oil, so as to render the water almost unfit for use. On learning that Drake had obtained oil by drilling into the sand rock, he concluded to do likewise. Not having the means to procure the necessary implements to carry his resolution into effect, he was obliged to seek for assistance, but for some time his efforts were in vain. Finally a merchant in Franklin, who became enlisted in the enterprise, sold him iron on credit, and he manufactured the tools himeslf. He then erected a derrick and by means of a spring pole drilled the well to the depth of 72 feet, when he struck a heavy oil in the first sand. He then put down the tubing and commenced pumping by hand, with a common pump, at the rate of 10 barrels per day, which he readily sold for $30 per barrel. The success of the well occasioned considerable excitement. A writer at the time says, "The town almost involuntarily pored forth its inhabitants to witness the natural curiosity. The attendants at court (which was then in session) went into a "committee of the whole," on the state of the oleaginous condition of the country, and adjourned to the Evans well. Attorneys, jurymen and witnesses who were concerned in the various cases then pending in the court of common pleas, suddenly became a self constituted judicial tribunal to decide upon the merits of this uncommon cause of public excitement."

Mr. Evans, having raised in a few days money sufficient to enable him to purchase an engine, he commenced pumping by steam power. The yield of the well was variously estimated at from 20 to 40 barrels in 24 hours. He was offered $50,000 dollars for an undivided half interest in his well and refused the offer, as his income then was probably not less than $2,000 per day.

This well has earned the fame of giving occasion for the famous saying, "Dad's struck ile." The story is vouched for as true, and runs as follows: Mr. Evans had a daughter, who was courted by a young man living nearby, and the course of their love ran smoothly enough until the ill starred day when the damsel's father reached the first sand and success in his well. On the evening of this day the swain, not dreaming of anything less pleasant than moonlight and love, called on his sweetheart and was met coldly at the door and promptly informed that he needn't trouble himself to come there any more, for "Dad's struck ile."

The quality of the oil obtained in this district is not the common illuminating oil, but lubricating oil of the best quality, being similar to the best West Virginia oil, which is 28 degrees gravity, while that of Franklin ranges from 30 to 32 degrees, and is now taking the lead in the markets of the world as a lubricator.

At the present time the production is estimated at 150 barrels per day. The largest production having been reached in the early part of the excitement, amounting to 1,250 barrels per day, which was caused by the striking of a number of large wells on the Galloway farm, one of which produced 150 barrels per day. The number of wells now pumping will reach about 1,150, many of which produced between 40 and 50 barrels each per day, when first drilled. Not a few of the wells included in the above estimate have been in operation from 40 to 44 years, quite a number of which produce a very small quantity of oil, but such wells are only pumped by "heads," once, twice or three times a day.

The depth of the wells in this district averages from 260 to 700 feet. The oil bearing sand and rock is from 50 to 80 feet in thickness, being an open, pebly rock.

HISTORY OF GALENA OIL, FRANKLIN, PA.

Names of the First Brands of Oil Manufactured and Sold—Coach, Engine, Car and Machinery Oils.

The lead process for mixing heavy Franklin oil was protected by letters patent of the United States by Charles Miller and John Coon. Their first refinery was built in 1869, near the James Evans well, the first oil well drilled in Franklin. The refinery was a very small one, located near the junction of the Allegheny river and French creek. After a short time R. H. Austin was taken in as a partner. The firm was then known as Miller, Coon and Austin, refiners. In a short time the refinery was destroyed by fire. A large kerosene refinery half a mile up the creek was vacant and for sale on reasonable terms. This was at once pur-

chased and the firm, strengthened by another valuable accession, was reorganized on a solid basis as the Galena Oil Works. Later Galena Signal Oil Works of Franklin, Pa.

ECLIPSE LUBRICATING OIL WORKS, FRANKLIN, PA.

The manufacture or refining of lubricating oils has for years been an important industry at Franklin. The Eclipse Lubricating Oil Works are located there and are the most extensive of its kind in the world, and have a capacity of 10,000 barrels per day, and generally keep the concern running up to this point. A ready market is found for the oils in England, Prussia, Austria and Russia. The company are now making arrangements for supplying the governments of Prussia and Russia for use on railroads, arsenals, navy and other public works. Oils were exhibited by the company at the Vienna exposition and were awarded a first medal and certificate for lubricating oils made from petroleum. I ought here to observe that the mode of refining adopted at these works is under patent, granted to H. W. C. Tweddle, the general manager of the company, in 1873, which latter own the patents and use them exclusively.

Eclipse Lubricating Oil Works, Franklin, Pa., organized 1868. Capital stock of the company was $200,000. The following is a list of the company's officers for 1873: A. G. Egbert, president; Chas. W. Mackey, vice president; H. W. C. Tweddle, general manager; W. H. Howard, secretary; W. M. N. Hayes, treasurer; Hon. John S. McCalmont, solicitor.

The Eclipse oil refineries, as stated, were started by Dr. H. W. C. Tweddle, an English chemist, in 1868. Dr. Tweddle interested a number of local oil producers who supplied crude oil in lieu of money to a very large extent. The vacuum process was first used. A battery of six 80-barrel stills was installed by this company, expecting to handle 1,000 barrels of crude oil a week. The enterprise went through various vicissitudes and finally into the sheriff's hands. It was bought at a sheriff's sale by the Standard Oil Company and was the first purely lubricating oil works the Standard owned. From the day the Standard Oil Company acquired the property until the present time its history has been one of continuous progress and success. Very largely the handling of the Franklin crude oil has been discontinued and the crude used at this works is the third sand oil.

The works has grown from a small plant covering about four acres until now it covers 125 acres and stretches something over 6,000 along the Allegheny river. They are handling 10,000 barrels of crude oil a day and make every commercial product manufactured from petroleum. There is only one other place in the world where this is done.

A large proportion of the products of this refinery are distributed all over the world, going to South Africa, Australia and the far east, as well as Europe.

Among the products they are turning out about 25,000 barrels a month of filtered cylinder oils and about 100 barrels a day of paraffin wax. This last product is almost entirely exported and has become one of the great commercial products of the country, having been put to a great many uses in the manufacturing world, and is being constantly introduced into new channels. A great deal of it is made into candles, but large quantities of it are used as an insulating material in conduits and subways connected with electrical plants, as a substitute for gutta percha. It is also utilized in many other ways that would be too numerous to name.

This particular refinery turns out also 3,000 or 4,000 barrels a day of illuminants, or burning oils, of various grades, and has on its list about 130 current products that it is manufacturing.

From 600 to 700 men are employed, and in the last five years the facilities have been materially increased, there being a constant endeavor to keep up with modern improvements. As an instance, a few years ago it was supposed that the acme of untility had been reached in 100 horse power tubular boilers. This company had something over a hundred of them in use. Today they have eight 600 horse power upright boilers of the so-called water tube type, and are installing them as fast as the others give out.

From the old Tweddle still of 80 barrels they have gone up to 1,500 barrel stills. From the old method of having steam pumps scattered all over the works, they have condensed them and are running so-called power pumps, having them assembled in three or four central points and running with large Corliss engines. They have no steam end to the pump, but a fluid end only. There have also been great improvements in other lines—in fact, all through this refinery has kept to the front with the most modern and latest appliances for the conduct of their business.

Col. S. C. Lewis is the head of the concern, having held the position of president for many years. For the past 20 years, by his untiring and indefatigable labor he has built up the works to its present large proportions. During 18 of the past 20 years Mr. Lewis has been ably seconded in all of his good work by Duncan McIntosh, his assistant, and the secretary and treasurer of the Eclipse. Mr. McIntosh is a man of large caliber, a business man of ability. R. J. Hanna, an old Franklin boy, is superintendent of the Eclipse Oil works and is the right man for the place. Mr. Hanna has demonstrated by years of preliminary work that he is competent to fill the position and has won the confidence and respect of the men under him.

Many fortunes have been made out of heavy oil since its discovery at Franklin, Pa., in 1859.

THE GALENA—SIGNAL OIL COMPANY.

The first heavy oil well was struck on French creek, in Franklin, Pa., in November, 1859, by James Evans, a blacksmith, who at the time was in straitened circumstances. The news of Drake's success near Titusville, Pa., started him to thinking. He hammered out rough drilling tools and with his son Henry rigged up a spring pole and bounced the drill in his water well. At 72 feet a crevice was encountered and the tools

dropped, breaking off a fragment of iron, which obstinately refused to be fished out, so pumping by hand was resorted to, and the two men plied the pump vigorously. A stream of dark green fluid gushed forth at the rate of 25 barrels a day. It was heavy oil, about 30 degrees gravity, free from grit and as smooth as silk. The greatest lubricant the world has ever known was thus unearthed.

Steam power later on increased the yield to 70 barrels a day, and inside of a year, on July 1, 20 wells were producing and 22 were being drilled, 15 of the former within the borough limits on November 1 yielding 140 barrels a day. The first flowing well was struck on May 15 to the tune of 100 barrels a day. The first shipment of oil was on April 27, to Pittsburg by the steamboat Venango, and consisted of 400 barrels. The oil then brought $30 a barrel.

Gradually the field was extended, but heavy oil has never been found, except in isolated spots, outside of about five square miles to the north of Franklin, Venango county, although a few small wells have been drilled on the southern limits of the city. The field is clearly defined and wildcatting is no longer indulged in. The runs of heavy oil through the Franklin pipe line average 4,000 barrels a month, and in addition there is perhaps a further production of 1,000 barrels which does not pass through the lines, making a total production of 60,000 barrels annually. The production in 1875 aggregated 130,000 barrels. In 1877 it dropped to 88,000, and in 1878 to 70,000. Thirteen hundred wells produced 60,000 barrels in 1883, so that it will be seen that the field is holding its own in good shape. It would be interesting to know the exact number of wells in the field, but there is no data at hand from which this is obtainable. One well posted producer places the average production for each well as low as a barrel and a half a month, but an average of two barrels would probably be more correct.

Many wells have been pumping for 30 years, and some as long as 35 years. In fact, three wells are still being pumped on the lease where the first well was struck in 1859, although the original well is not one of this number. Each lease is now fitted up with a pumping rig, from the power house of which radiate the rod connections that make it possible to operate as high as 80 wells with one boiler and engine or with a gas engine. This modern device connects wells which are far apart by coupling them with the rods, which are placed about 10 feet above the ground. The downward stroke of one helps the upward stroke of the other, each pair nearly balancing. This enables the owners of small wells to pump them at the least possible expense. It is worth traveling a long distance to stand on the hill and watch the pumping of the wells belonging to Baum, Grimm, Cain, Grant, Sheasley and James (some of the largest operators), some of them a mile from the power that sets the strings of connecting rods in motion. If some of these wells give forth but a few gallons a month, the whole goes to constituting a total production which makes any one of these leases a very valuable piece of property.

For some time heavy oil was used principally in its natural state, being the finest lubricant for all kinds of machinery just as it comes from the wells. The entire product of the Franklin field, with the exception of that of the Smith farm and one or two other leases, is now and has been for years purchased by the Galena Signal Company, of which General Charles Miller is president and Representative Sibley a large share holder. The price remains stationary at $4 a barrel at the wells. As this is the only oil that will stand the freezing test of 20 degrees below zero, it is a great factor in the oils which that company produces for the railroads of the United States and other countries, for it is a fact that no matter in what direction you may travel in this country, the cars are oiled with Galena oil, while the headlights are furnished with signal oil. That company oils the rolling stock of 98 per cent of the railroads in this country, Canada and Mexico, and already has a good foothold in England and on the continent.

It will be news to all readers to learn how this company contracts to furnish its oils. It has a department whose business it is to know the exact amount of rolling stock owned by each railroad and this is the basis upon which they operate. Knowing the mileage of each road they are able to submit figures to oil a road for so much a mile by the year and this is the way their contracts are written. They employ a force of half a hundred men, most of them old engineers, who are located in various parts of the country, whose duty it is to go on the locomotives with the engineers, either to remedy any defects where the oil does not appear to give satisfaction, or to show them how to economize if they think they are too extravagant in the use of the oils. These men, along with the salesmen, meet in Franklin, Pa., in June of each year to discuss the business and profit from each other's experience. The new Galena-Signal office building is provided with a large and finely furnished lecture room for their especial use on these annual occasions.

Within the past few months when freight has been so congested on all the railroads, the Galena-Signal company has experienced great difficulty in delivering their oil to the consumers, without which traffic on the different roads would be brought to a standstill. So many cars were lost that the railroads found it impossible to locate them in the usual manner, and the Galena-Signal Company resorted to the very expensive expedient of placing men at the different terminal points and doing all their tracing by the liberal use of the telgraph.

The Franklin heavy oil district has turned out many a fortune and is still a great factor in the prosperity which the city is now enjoying.

TORPEDOES—NITRO-GLYCERIN.

THE OIL WELL DRILLER would be singularly incomplete without mention of the Roberts torpedo, for to this remarkable invention may be attributed, more than to any other agency, the success which has attended its prosecution. I propose, therefore, to present, as concisely as possible, a history of this invention, from its inception to the present time.

In 1862 Col. E. A. L. Roberts, then an officer in the

volunteer service, and with his regiment in the army of the Potomac, in front of Fredericksburg, conceived the idea of exploding torpedoes in oil wells for the purpose of increasing the production. He made drawings of his invention and in November, 1864, made application for letters patent. In the fall of the same year he constructed six torpedoes and on the second of January, 1865, he visited Titusville, Pa., to make his first experiment. Col. Roberts' theory was received with general disfavor, and no one desired to test its practicability at the risk, it was supposed, of damaging a well. On the 21st of January, however, Col. Roberts persuaded Captain John Mills to permit him to operate on the Ladies' well, on Watson flats, near Titusville. Two torpedoes were exploded in this well, when it commenced to flow oil and paraffine. Great excitement of course followed this successful experiment and brought the torpedo into general notice. The result was published in the papers of the oil region, and five or six applications for patenting the same invention were immediately filed at Washington. Several suits for interference were commenced, which lasted two years, and decisions in all cases were rendered declaring Col. Roberts the original inventor.

Notwithstanding the success of the first experiment, operators were still very skeptical as to the practical advantages of torpedoes, and it was not until the fall of 1865 that they would permit the inventor to operate in their wells to any great extent, from fear that the explosion woull fill them with rock, and destroy their productiveness.

In December, 1866, however, Col. Roberts exploded a torpedo in what was known as the Woodin well, on the Blood farm. This well was a dry hole, never having produced any oil. The result of the operation secured a production of 20 barrels per day, and in the following month, January, 1867, a second torpedo was exploded, which brought up the production to 80 barrels. This established for the torpedo, beyond question, all that Col. Roberts had claimed, and immediately the demand for them became general throughout the region. I present below a tabular statement of the result of the first 38 wells torpedoed:

THE RESULTS OF THE TORPEDO.

NAME AND LOCATION OF WELLS	Increase in Barrels	Pumping & Flowing
Woodin well, Blood farm	80	Pumping
Two wells for Mr. Archer, Tarr farm	60	Pumping
Tarr homestead No. 1	60	Flowing
Tarr homestead No. 2	65	Flowing
Monitor well No. 2	35	Pumping
Vogan	30	Pumping
Keystone well	185	Flowing
Sherman homestead well	60	Pumping
Manhattan well, Story farm	75	Flowing
Clara well, Pit Hole, no increase, but made the Andy Johnson well flow	150	Pumping
Burnett well, Tarr farm	65	Flowing
Gardner's well, Pioneer Run	8	Pumping
A. Aldrich, Tip Top well, Tarr farm	35	Pumping
Smith well, Tarr farm	10	Flowing
Hawkins well, Petroleum Center	20	Pumping
Anderson well, Petroleum Center	90	Pumping
Monitor well No. 1, Tarr farm. Two torpedoes	10	Pumping
Mahaffy well, Petroleum Center	4	Pumping
Ennis well, Cherry Run	35	Pumping
Hunter well, Story farm	20	Pumping
Hamburgh Oil Company, Story farm	30	Pumping
Morse well, Blood farm	30	Pumping
Woodin well, Blood farm second, time	30	Pumping
No. 8 well, John Rynd farm	75	Flowing
Hyde well, Story farm	35	Pumping
Mitchell well, Cherry Run	10	Pumping
Parker well, No. 1, Tarr farm	125	Flowing
Bakery well No. 1, Tarr farm	200	Flowing
Columbia Oil Company, Story farm	10	Pumping
Refinery well, Blood farm	10	Pumping
Tarr reserve well, Tarr farm	35	Pumping
Blanchard well, Blood farm	30	Pumping
Catskill well, Cherry Run	15	Pumping
Duff well, Tarr farm	90	Flowing
Mahaffy No. 2, Petroleum Center	10	Pumping
Hays well, Petroleum Center	30	Pumping
Briggs & Severence well, Church Run	40	Pumping
Anderson well, Petroleum Center, second time	125	Pumping
No. 272 well, Petroleum Center, second time	200	Pumping

In 1865, immediately after operating on the Ladies' well, a company was organized in New York for the purpose of prosecuting the business with the following officers: President, William S. Fogg, 24 Fulton street; vice president, James W .Simonton, 145 Broadway; secretary, W. B. Roberts, 47 Bond street; treasurer, Erastus Titus, 283 Washington street; counsel, Hon. Gilbert Dean, 74 and 76 Wall street; superintendent, Col. E. A. L. Roberts, Titusville, Pa.

Trustees: Walter B. Roberts, Wm. H. Dwinelle, M. D., A. G. Trask, Erastus Titus, Gilbert Dean, Wm. S. Fogg, Erastus Titus, jr., Wm. H. Akin, James W. Simonton, Wm. H. Chapman, E. A. L. Roberts.

About the time the Woodin well was struck (1866) the wells of the region had materially decreased, and but little oil was produced. There was general apprehension that the territory had been drained and would soon be quite exhausted unless new belts were discovered. But the application of torpedoes immediately effected a revolution, and during the summer of 1867 the wells on Oil Creek were increased several thousands barrels. Immediately thereafter Col. Roberts introduced nitro glycerin as an explosive for his torpedoes and established a manufactory near Titusville and during the year 1872 some 25 tons of this compound were used for this purpose alone.

The developments of Tidioute, Shamburg and other districts followed the operations of 1866, and the employment of torpedoes continued with the same striking success. And it may be safely stated that up to the present time over one-third of the oil production has been dependent upon the use of this invention.

In the summer of 1866 infringements commenced by different parties throughout the oil region, and suits were instituted by Col. Roberts against the parties and injunctions granted. In 1868 the Reed Torpedo Company was organized, with several oil operators at its head, for the purpose of infringing and

breaking down the Roberts patent. Suits were commenced by Col. Roberts against all parties and carried to a final hearing before Judge Grier of Philadelphia, and decisions were given in favor of Roberts and judgments rendered to the amount of $10,000. Numerous other suits were commenced and final judgment rendered, among which was one against James Dickey, which was tried before Justices Strong and McKennan in Washington, in January, 1871. An elaborate opinion was renered in this case in favor of Roberts. The case was regarded with great interest in the oil region, from the magnitude of the considerations involved and the newspaper controversies upon the subject. Since the great rubber suits no patent suit has elicited more general attention, involved so important consideration, or its termination more anxiously awaited. The sum of $50,000 had been subscribed among the producers for the purpose of breaking down the Roberts patent, and such a result was looked for with entire confidence. Few cases have ever enlisted higher professional ability, or been more earnestly contested. Messrs. Bakewell and Christy, of Pittsburg, and Geo. Harding, of Philadelphia, conducted the case for Roberts; and Messrs. Kellar and Blake, of New York, were employed by the oil producing interest for the defence. The decision was rendered in May, 1871, and was in favor of Roberts. It was made the occasion of a very elaborate and exhaustive opinion, which, as a matter of course, was received with general disapprobation on the part of the producers and occasioned great disappointment. Very many suits were brought for infringements, and over $100,000 was expended by the inventor in protecting his legal rights.

Roberts torpedo patent for torpedoing oil wells was dated June 1, 1863; reissued June 1, 1873; expired June 1, 1879.

NITRO-GLYCERIN.

A POWERFUL EXPLOSIVE.

The process of manufacture of nitro-glycerin was discovered by Prof. Ascanio Sobrero, an Italian chemist, in 1846. Nitro glycerin was first successfully used by Alfred B. Nobel, a Swedish engineer at Helenborg, Sweden, in 1861. Nitro glycerin has 13 times the power of the same bulk of gunpowder, and eight times the power of the same weight.

Compounds in nitro glycerin: Sweet glycerin, nitric acid and sulphuric acid. The word nitro-glycerin is a compound word. *Nitr,* from nitric acid, *o* from sulphuric acid and glycerin from sweet glycerin—nitro-glycerin.

SWEET GLYCERIN.

In composition is a sweet substance that forms the basis of fatty matter; a transparent liquid, without color or smell, of a syrupy consistency and is used as a medicine.

Nitric acid is a colorless fuming fluid which discolorizes indigo, stains the skin, and when added to cotton forms an explosive called guncotton.

Impregnated with nitric acid. Nitric acid is composed of oxygen and nitrogen or azote, from its fatal effects upon animal life, but more generally causing a severe headache to those who handle it in the proportions of two equivalents of the oxygen to one of the nitrogen.

Sulphuric, pertaining to sulphur. More strictly designating an acid formed by one equivalent of sulphur combined with three equivalents of oxygen, as sulphuric acid, formerly called vitriolic acid or oil of vitriol.

Nitro-glycerin is formed by dissolving glycerin in equal parts of nitric and sulphuric acids, agitated together and washed through water, it begins to decompose at 150 to 180 degrees F. and explodes at 450 degrees; also if allowed to become solid at from 40 to 45 degrees. The red danger mark on all thermometers used for making nitro-glycerin is 100 degrees.

NITRO-GLYCERIN.

How it is Made and What Happens When it is Destroyed.

Nitro-glycerin and its peculiarities are little known, even in localities where it is made. Probably in no other place in the United States is there such an amount of the explosive used as in the oil fields. The explosive is made from a composition of acids and glycerin. It is generally pale yellow in color. It is odorless and has a sweet, pungent, aromatic flavor. If touched by one's tongue, or even brought into contact with the skin, it will produce a severe headache. A large tank, called an agitator, is where the fluid is mixed, and the mixture is composed of equal parts of nitric and sulphuric acids. Inside the tank are several paddles, like those of a churn, and it is here that the real danger in the manufacture exists. The paddles are put into operation and a steady stream of glycerin is turned into the vat until 220 pounds are thoroughly mixed with 1,500 pounds of acid. The chemicals coming in contact produce an intens heat, and in order to obviate the danger cold water is run through pipes encircling and running through the vat. At 400 degrees Fahrenheit a red vapor, almost like fire arises. If cutting off the supply of glycerin in the agitator does not lower the temperature, it is time to say farewell. Before 450 degrees are reached nothing but atoms of the structure and its contents are left.

However, it is a fact that all the thermometers used by the makers of nitro-glycerin have a red danger mark at 100 degrees.

In its manufacture water is used to flood the workroom, since a drop falling on the floor might lead to an explosion. Not a nail is to be found in the floor of the factory, and the visitor is cautioned not to drag his feet. Those who make the dangerous fluid say that one may pour a barrel of nitro-glycerin from a high building to a cement walk below and it will not explode, but a small quantity dropped from the same height in a can will blow the building up. A sharp concussion instantly touches it off.

The average production of glycerin from 1,500 pounds of acid and 220 pounds of glycerin is about 140 quarts. While nitro-glycerin magazine explosions are not rare, the real cause of the blowing up never becomes known. Those who are close enough to see the cause always go up with the building. The average time for a shooter of nitro-glycerin or maker to remain in the business does not exceed 15 years.

Very few ever recover from a nitro-glycerin accident and those who are killed have their bodies torn to atoms. A great number of persons have been killed by the so-called empty nitro-glycerin tin cans. Beware of the dangerous empty nitro-glycerin cans.

LIST OF NITRO-GLYCERIN TORPEDOES.

Size.	Lbs.	Size.	Lbs.
3 qts	10	20 qts	66
4 qts	13	24 qts	80
6 qts	20	30 qts	100
8 qts	26	40 qts	133
10 qts	33	60 qts	200
12 qts	40	80 qts	266
16 qts	53	100 qts	333

DIAMETER AND LENGTH OF 20-QUART NITRO-GLYCERIN TORPEDO SHELLS.

Diameter.	In. to qt.	Length.
2 inch	18¾	30 ft. 7⅝ in.
2¼ inch	14½	24 ft. 2½ in.
2½ inch	11¾	19 ft. 7¼ in.
2¾ inch	9¾	16 ft. 2½ in.
3 inch	8½	13 ft. 7⅜ in.
3¼ inch	7	11 ft. 7¼ in.
3½ inch	6	10 ft.
3¾ inch	5¼	8 ft. 8⅝ in.
4 inch	4⅝	7 ft. 7⅞ in.
4¼ inch	4⅛	6 ft. 9⅜ in.
4½ inch	3⅝	6 ft. ⅝ in.
4¾ inch	3¼	5 ft. 5⅛ in.
5 inch	3	5 ft.

REVISED PRICE LIST OF NITRO-GLYCERIN TORPEDOES.

Size.	Price.
3 quarts	$20.00
4 quarts	22.00
6 quarts	24.00
8 quarts	27.00
10 quarts	30.00
12 quarts	32.00
16 quarts	38.00
20 quarts	43.00
25 quarts	49.00
30 quarts	54.00
40 quarts	60.00
50 quarts	67.00
60 quarts	74.00
80 quarts	87.00
100 quarts	100.00

DIAMETER AND LENGTH OF 20-QUART SHELLS.

Diameter.	In. to qt.	Length
2 inch	18¾	30 ft. 7⅝ in.
2¼ inch	14½	24 ft. 2½ in.
2½ inch	11¾	19 ft. 7¼ in.
2¾ inch	9¾	16 ft. 2½ in.
3 inch	8½	13 ft. 7⅜ in.
3¼ inch	7	11 ft. 7¼ in.
3½ inch	6	10 ft.
3¾ inch	5¼	8 ft. 8⅝ in.
4 inch	4⅝	7 ft. 7⅞ in.
4¼ inch	4⅛	6 ft. 9⅜ in.
4½ inch	3⅝	6 ft. ⅝ in.
4¾ inch	3¼	5 ft. 5⅛ in.
5 inch	3	4 ft. 10⅞ in.
5¼ inch	2-2-5	4 ft. 5⅜ in.
5½ inch		4 ft. ⅝ in.
5¾ inch		3 ft. 9
6 inch		3 ft. 4⅞ in.
Charges for each day after the first day		$15.00

DYNAMITE.

(*Dynamite*, from the Greek, Meaning Strength.)

How to make dynamite. The most powerful dynamite is made of 60 per cent of nitro-glycerin, 30 per cent of wood pulp—sawdust, and 10 per cent of nitrate of soda. The lowest grade of dynamite is made of 20 per cent of nitro-glycerin, 60 per cent of wood pulp—sawdust, and 20 per cent of nitrate of soda. Granite dust is used instead of wood pulp—sawdust—for blasting salt. Wood pulp blackens the salt.

TORPEDOING OR SHOOTING AN OIL WELL.

When the productive rock strata, oil sand, has been reached the next step in the process is to shoot or torpedo the well, unless it has proven a gusher, or flowing well. This plan for increasing the production of oil was devised in 1862 by Col. E. A. L. Roberts of the United States army, and like almost every other new idea, it met at first with great opposition on the part of the oil men. After four years of argument Colonel Roberts was given permission to experiment with the wooden well near Titusville, which had never produced any oil. The first shot made it a producer at the rate of 20 barrels a day, while a second charge, put down a month later, brought the daily flow to 80 barrels.

The operation is simple enough. When a well is ready to be shot, the torpedo company is notified, and the charge of nitro-glycerin is sent to the spot in cans carried in padded compartments in a light spring wagon. Although the driver knows the nature of his load, he becomes oblivious to the danger, and often races at a reckless speed over the rough mountain roads. Every one gives him a wide berth, however. When an accident does occur there is nothing left to tell the tale.

A charge usually consists of about 80 quarts, or 265 pounds of the explosive, and it is carefully low-

ered into the well in shells about six feet long and five inches in diameter, by a hemp rope one-quarter inch in diameter, and 3,000 feet long. The rope is coiled on an adjustable reel attached to the balance or fly-wheel of the engine. The engine is located in the engine house of the well. The reel is governed with a brake by the man known as "a shooter." The rope passed over the walk from the reel in the engine house into the derrick, to and over a small pulley attached to the drilling stem or bailer by a piece of soft rope about five feet above the casing head. The stem rests on a block of wood near the casing head. If the bailer is used the lower end or dart is tied to the casing head with a piece of soft rope. The casing head is the top cover of the well on the floor in the center of the derrick. On the end of the torpedo rope is attached a small hook. The top of each shell is provided with a bail. The bail of the shell is hung on the hook on the end of the torpedo rope near the small pulley over the center of the hole. The other end of the rope is coiled around the reel in the engine house. The reel is locked by a brake. Then the shooter begins to fill the shell. This is done by pouring the nitro-glycerin from the eight-quart square tin cans which the nitro-glycerin is shipped in. After the shell is filled the shooter goes to the engine house and loosens the brake on the reel and begins to unwind the reel very slowly. As the reel unwinds the shell lowers into the well. When the shell reaches the bottom of the well this reduces the weight on the rope and gives the reel a light jar. This tells the shooter the shell is on the bottom of the well. Ten or fifteen feet of rope is unwound from the reel. This slackens the rope in the well and unhooks the hook from the bail on the shell. The brake is again locked on the reel, and the engine is reversed and run backward. This reels the rope out of the well. This is repeated until all of the shells are lowered into the well, the bottom of each being made conical so it will fit snugly into the top of the one next below it. On the top of the uppermost section is a cap or exploding device called a squib. Everything being in readiness the shooter drops into the well a 5-pound piece of iron called the "go-devil," and at once seeks a place of safety from which to watch the results.

In the shallow wells the nitro-glycerin is set off by an electric battery. In wells of 1,000 to 1,500 feet deep jack-squibs are used. These are tin shells about two feet long by two inches in diameter, and are loaded with dynamite, cap and fuse. When the well is ready to be shot the shooter lights the fuse of the squib in the engine house and walks out to the well with the squib and drops it in the hole. From a two thousand foot well no report of the explosion is perceptible, but after a few minutes a gurgling liquid is heard rushing up to the surface, and then with a grand burst the fountain of oil and gas bursts forth, accompanied by a shower of bits of rock and pieces of the shells. Nothing is done to stop the first flow from the well, and at least 25 or 30 barrels of oil are lost at every shot.

OIL COMPANIES.

A FEW SPECIALLY MENTIONED.

THE HARMONY OR ECONOMITE SOCIETY.

It was not the intention to give special notice of the existence of individual associations and companies. I, however, make exceptions in a few instances. I do so because these present interesting and peculiar features. In the case of the Economite Society their history is of marked interest to the public, because of their strange organization, their singular history and their great success as oil operators. The Harmony Society was founded near the beginning of the nineteenth century by George Rapp and a colony of emigrants from Wurtemburg, numbering over 100 families. They belonged to that class of devout people in Germany to whom in the previous century had been given in reproach, the name of Pietists. Dissatisfied with the state of religion in the established Lutheran church, they gave themselves to the more diligent private study of the Scriptures, and to the edification of each other in social assemblages for conference and prayer. Two men arose among them who, by force of character, became leaders. These were Michael Hahn and George Rapp. They were earnest, zealous men, who magnified their office by gathering together on the Sabbath the people who sympathized with them, and administering to them words of instruction and encouragement.

Hahn had commenced the work of preaching at an earlier period than Rapp. He was a man of more literary culture, and made use of the press in the work of reformation. He was an humble farmer, with limited education, but he was a man of deep religious spirit and great force of character. Feeling himself constrained to proclaim to others the religious convictions which filled his own heart, he soon gathered around him a number of followers of kindred views. The work grew gradually until several hundreds looked to him as their leader. These movements excited the opposition of their more worldly neighbors, and especially of the clergy, whose ministrations they neglected. Hahn and his adherents, under the name of Pietists, still retained their connection with the established churches, giving at least occasional attendance on the ordinances as then administered. Like the first Methodists in England, they hoped to bring about a reformation within the church itself. They thus escaped in great measure the persecutions which arose against Rapp and his followers, who refused to attend upon the ministrations of the regular clergy. They were called Separatists, and although demeaning themselves as quiet, orderly citizens, and paying their dues both to church and state, they became objects of odium, and were denounced to the civil authorities by the offended clergy. They were persecuted with fines and imprisonment, and their appeals for redress were in vain. After long endurance and after having made an ineffectual application to their own government for permission to form a settlement by themselves, they

determined to emigrate. In the year 1803 George Rapp visited this country in search of a location suitable for a colony. He purchased a large tract of land near Zelienople, in Butler county, Pennsylvania, and in the autumn of the ensuing year three ship loads of colonists arrived.

Before leaving Germany they had embraced some peculiar views of religion and social economy, to which they were led, as they supposed, by their careful study of the New Testament. They had generally adopted the millenarian theory of the personal and premillenarian advent of Christ, which they regarded as near at hand. They were also disposed to follow the example of the primitive Christians, in having all things in common. It was not, however, until some years later that this practice became a law among them. Soon after their settlement in this country marriage was prohibited, celibacy being strictly adhered to by members of the society.

The society for some reason changed their location, having purchased lands in the valley of the Wabash, in Posey county, Indiana, disposing of their property in Pennsylvania at a great sacrifice. After a residence of 10 years on the Wabash they again determined to change their location, finding the country unhealthy and their neighbors ignorant, vicious and turbulent. It is said unpleasant collisions occurred between them and the peacefully disposed Harmonists. These circumstances induced them to think of returning to Pennsylvania.

In 1825 they made a purchase of their lands in Beaver county, Pennsylvania, on the Ohio river, about 18 miles from Pittsburg. They built a steamboat and removed in detachments to their new and final place of settlement. Here they founded a town, to which they gave the name of Economy, and from this circumstance the popular name of the society is derived.

A few years prior to the discovery of oil the Economists' Society came into possession of a large tract of land, some 6,600 acres, opposite Tidioute, in Warren county, Pa. This land was originally purchased as a lumber enterprise, for the supply of their own wants and to meet the extensive demand for timber at their mills in Economy. This tract proved to be valuable oil territory, as is now well known. When oil was first discovered it was a great and unexpected addition to the value of their lands, and they generously intrusted the management of it to the former proprietor, with such share of the profits as enabled him to retrieve his shattered fortune and place his family in independent circumstances. They then took the whole business into their own hands.

In the early part of the summer of 1860 oil was found immediately below the river tract belonging to the society, which created great excitement, and many persons sought to purchase or lease the land from them, but fortunately for them a law suit was then pending for the possession of this tract, which prevented leasing or sales. In September of the same year they took actual possession of this tract, located five different wells upon it, made contracts for drilling them, and engaged workmen for the vigorous development of the property. The first two wells drilled were entire failures. The third had a pretty good show of oil, but finally proved to be nearly worthless, after three months of hard labor and the expenditure of a large amount of money. The prospect of success now looked gloomy, but they hoped and worked on, and unexpectedly at the depth of 99½ feet the drill struck the first sand, and in a few minutes large quantities of oil and water were thrown high above the derrick in a continuous stream. This well flowed steadily for six months, gradually decreasing in production, then stopped and flowed periodically, and at the end of nine months ceased to flow, and afterwards was pumped for a number of years. Immediately after the striking of the flowing well, a new well was struck near to it, which at first produced but little oil, but after some time proved a good well, and continued to produce for eight years.

During the spring of 1861 eight wells were finished, four of which were failures, and four of them good shallow wells, of not more than 150 feet in depth.

In March, 1862, the society had four good producing wells; had erected a number of buildings, made roads, constructed wharves—a cooper shop, with a stock of several thousand barrels to send their oil to market; a blacksmith shop, carpenter shop and all the necessary tools.

The history of the society's operations for the years following, up to 1868, is varied, meeting like all other operations, with successes and reverses, but still maintaining their position against all the drawbacks incident to the business.

In 1868 the society met with marked success, having sold during the year upwards up 100,000 barrels of oil, and in 1869 over 75,000 barrels.

From the records of their drillings I find that the wells vary in depth from 99½ feet to 578 feet, and the oil bearing sand from 12 to 55 feet in thickness. Their largest well was 250 barrels a day.

It is something remarkable that the Economites never pumped their wells on Sunday. They declared that their wells did not suffer thereby, though of like character to those of their neighbors, being subject to water, which was presumed to injure wells by standing on the oil bearing rock. I dare say the fact of the Economite wells being so long lived is an argument in favor of their practice of cessation of pumping on Sunday.

In a few instances the trustees leased small portions of their oil territories, and in all such cases they made binding, it being in the lease, not to pump on the Sabbath. Their operators said that they have never known their wells injured by cessation of pumping on Sunday.

The society was represented in all its business matters by two trustees, one of whom formerly took especial care of their oil interests. We refer to Mr. R. L. Baker, now deceased, who was ably assisted by Mr. Jacob Henrici. After Mr. Baker's death Mr. John Lenz was selected by the society to fill his place.

There were no members of the Economite Society on the Tidioute property. The business was conducted by their agents, under the supervision of the trustees, who made frequent visits of inspection. I ought not to omit to mention that most of the land of the

Tidioute property was valuable as timber land, on which the society has two large sawmills.

The Economites are very few in number now, as death is thinning them out, and their adoption of celibacy and their numerous quarrels, as a matter of course put an end to their existence, and their vast property has been divided and sold to other parties.

THE LOWER OIL FIELD.

ST. PETERSBURG, FOXBURG, PARKER'S LANDING AND BUTLER COUNTY, PA.

In the year 1860 Thomas McConnell, W. D. Robinson, Smith K. Campbell and Col. J. B. Finley of Kittanning, purchased two acres of land on the west bank of the Allegheny river, about 90 rods north of Tom's run, from Elisha Robinson, sr., and organized the Foxburgh Oil Company, consisting of 16 shares, and commenced putting down a well, which reached a depth of 460 feet, when an accident occurred to obstruct operations for a few days. In the interval the war broke out and the excitement incident thereto stopped all further work on the premises, and the well was abandoned.

Subsequently the same parties purchased 100 acres, known as the Tom's run tract, from Mr. Robinson, for which they paid $50 per acre. In 1865 the company sold about 30 acres of this purchase to a number of gentlemen in Philadelphia, for the sum of $20,000. On these 30 acres the Clarion and Allegheny River Oil Company put down their first well, which struck oil in October, 1865, the first to produce in that locality.

Many were the scoffs and jeers and insulting remarks made about these first operators. They were held up to ridicule by men of means, as well as by others, and were euphoniously called "crazy," having "oil on the brain," etc. The followers of these pioneers are now, however, numerous.

It is remarkable that the well of 1860 was put down on territory which has since proved dry, and had it then been finished would have undoubtedly been a failure, and possibly prevented all future development in this region. But it was not to be so. It was abandoned for a period of four years before the Allegheny and Clarion River well had been commenced, and which, proving a success, gave this field to the world at a time when Venango county was rapidly declining in product.

The Pennsylvania oil region is divided into two grand divisions, termed the upper and lower region, or the creek region and the river or Parker's Landing region. The tendency for operations has of late moved towards this lower division of the oil field. Here the great bulk of the present production is obtained and here are to be found the leading men of this great industry. . From the first developments in this section operations have been conducted on the theory of a belt, or series of belts.

In 1868 some wells were struck at Lawrenceburg, situated on the hill just above Parker's Landing. A well known operator, Mr. Marcus Brownson, of Titusville, acting on data—the result of actual operations—projected a line or belt from this point north, 22 degrees east, and south 22 degrees west, in breadth about five miles, and in length as now developed about 35 miles, and venturesome operations soon opened up a belt, the end of which has not yet been reached in either direction. Many were stimulated to wildcat, and it was found that northeast of this, which may be termed the central belt, is one extending up the Clarion river, out through Turkey run, in Clarion county. Southward it passes a little to the west of Millerstown, Butler county. To the westward of the eastern, or central belt, is another, extending and developed from the Russel farm, opposite Antwerp, in Clarion county, to a point abreast of Lawrenceburg on the east, with the Robinson, Black and Grant farms ,which may be termed the western belt. Then there is a break in the development in this middle belt of some three miles, until the Stonehouse property is reached on the west line. This belt will pass not less than five miles to the left, or east of the borough of Butler, Butler county. Between the central and east belts the distance is about one mile; between the central and west belts about three miles. The eastern belt is of the greatest importance; in fact, the middle belt appears to run into it, after they cross Bear creek, east of Lawrenceburg. (I ought here to say that many operators differ in their opinions from this last suggestion.) Actual developments northeast of Lawrenceburg show that this eastern belt runs through Parker's Landing, Foxburg, St. Petersburg, Antwerp, etc. Below, and just across Bear creek, are the Say and the Stonehoues farms. Then follow, lying end to end, the Fletcher and Campbell farms, the Martin and Hutchinson, the Gibson and Turner farms, the Robert Campbell and Marcus Brownson farms, the Mayville tract, the James Campbell and Ward farms, the Canada Oil Company and A. L. Campbell and Wilson farms, the Blaney and Dougherty farms at Petrolia City, the McClymonds, Wilson and Bank farms, the J. B. Campbell and the Adams farms, the Story and Riddle farms at Karns City, and last the Moore and Hepler farms, now known as the Angel Oil Company's tract, which consists of 270 acres, and lying in the Millerstown belt. From Bear creek to the Angell tract the distance is about 10 miles and the average width four miles, giving an area of 40 square miles developed or in process of development.

Prominent among the first wells of this region, and perhaps I should say, the belt just described, was the noted one on the McClymonds farm, at the date of its completion, one mile and a half in advance of other developments. It was drilled some 1,400, 50 feet deeper than the wells thereabouts, and the owner, fearing the rock had run out, sold it as a dry hole to Morehead, Tack and Preston, who purchased it solely on the strength of their belief in the existence of belts. Three hours after they had purchased it the drill entered the sand, and before the well could be tubed 700 barrels of oil flowed out of it. Their success encouraged others, and the intervening territory was rapidly developed. A town called Karns City, a compliment to Mr. S. D. Karns, a well known operator, was soon built up.

The success at Karns City greatly emboldened oper-

ators, and the line of the western belt was then projected in the direction of Butler, seven miles out. Several wells were started on the Jamieson farm, in the latter part of the year. Four of them produced 200 barrels a day for a considerable time. This point has since been called Greece City, and now has a population of 4,000 or 5,000. This is the largest jump ever taken, there being some four or five miles of undeveloped territory in the rear. On the Angell Oil Company's territory, lying along the line of the central or eastern belt, successful strikes have but recently been made, and thus all the territory near or between it and Fairview, a distance of some two miles, has been opened.

The St. Petersburg district, upon the east side of the Allegheny river (it may be said to be from one to eight miles from it, and its limit has not yet been reached) is northeast of the Butler oil field. The general direction of the belt, like that just described, is northeast and southwest. Developments in this district were commenced in the summer of 1869 and the first well was struck in September of that year. This was the Mead well, south of the Clarion river and near its mouth. Soon after the Elephant well, near the first named, was struck. Parties then began to extend developments north of the river and in October following a well was struck there, and operations continued on up the Allegheny to where Foxburg now stands. The wells on this portion of the new field were not extraordinarily large. The pioneer who pushed developments back from the Allegheny to St. Petersburg was Marcus Hulings, who struck the Hulings or Antwerp well, in November, 1871. This well started up at the rate of 100 barrels a day, and maintained this production for some time. It is still producing oil. and pumps about seven barrels a day. Within two weeks after the Hulings well was struck 25 wells were commenced on the J. J. Ashbaugh and Dan Ritz farms, in and around the borough of St. Petersburg. The farms between the Allegheny river and St. Petersburg were soon taken up by active operators and derricks were rapidly reared all along the line. These farms are the Frederick Rupert, Whitting, Shoup, Collins, Foust and Keating. Then commenced the building up of St. Petersburg, which is now one of the important villages of the lower oil field. Early in the spring of 1872 building went on rapidly (it had previously been a farming settlement and center), as there was a large influx of population. Houses were put up at the rate of 25 a day. Shortly afterwards it was incorporated as a borough. The distance from the Allegheny to St. Petersburg is two miles. A quarter of a mile beyond St. Petersburg stands the village of Antwerp. St Petersburg contains a population of 2,500 to 3,000.

The thickness of the oil bearing rock in this district is 25 feet nine inches. The average depth of the well is 975 feet. The deepest is the Fountain well, which is 1,241 feet. The shallowest, the Antwerp or Hulings well, is 790 feet. These two wells are half a mile apart.

The lower oil field proper is varied and beautiful in scenery. The land is rolling, fertile and fairly cultivated. The homes of the old settlers bear the marks of peace and plenty. The hills and valleys contain rich deposits of coal, and their bowels rivers of oil.

Recent developments have centered at points lying between and including Petrolia and Fairview on the north, and Millerstown on the south, and Karns City on the east, and Greece City on the west, all in Butler county, Pa., which comprise the best producing oil territory of late years. At no period in the history of petroleum developments has there existed such a large number of flowing wells as are to be found at the present writing, and at no time has there been so large a production of oil.

The country has been chiefly developed by combinations of individuals, some ventures being divided into sixteenths. The most prominent gentlemen engaged in developing this territory are S. D. Karns, C. D. Angell, Parker, Thompson & Co., Lambing Brothers, Campbell Brothers, Fisher Brothers, Tack Brothers, Moorehead and Ripley, Robert Leckey, H. W. Scott, F. F. A. Wilson, Marcus Brownson, Dimick, Nesbitt & Co., John Preston, John L. and J. C. McKinney, and John H. Gailey, Vandergrift & Foreman, Phillips Brothers, H. L. Taylor, John Satterfield, Tarbell & Hess, and others not known to the writer.

THE MODOC DISTRICT.

Having in the early part of this chapter noted the lines of development and marked its progress, I will now proceed to chronicle the more recent developments with a brief sketch of the progress of the work.

We have already made mention of the striking of the Troutman well on the Troutman farm, in that portion of this oil field known as the Modoc City district. This famous well, which began flowing enormous quantities of oil on the 23d of March, 1873, is situated on a tract of land of some 55 acres, upon which a Frenchman named Troutman settled some four years since. A party of capitalists known as the Hope Oil Company, purchased the land about one year ago. This well created great excitement among operators, and soon extensive operations were commenced in the neighborhood. The amount of oil produced for the first few days is variously estimated at from 800 to 1,000 barrels a day. From the 23d of March to the 10th of September of 1873, this well produced, according to the pipe line company's receipts, 85,413 45-100 barrels. Add to this 3,000 barrels lost for want of tankage, the first few days of its production. The production on the 10th of September was 308 barrels, after flowing five months and 17 days. The Troutman is 1,440 feet in depth, and was sunk as a test well, the success of which soon attracted operators to the locality. Surveys were made and leases given out. The following shows the results thus far of this wonderful territory:

	Barrels.
The Troutman well, Troutman farm, struck 23d of March, 1873, now producing daily....	308
Capt. Grace well, John Starr farm, struck in July, '73, now producing daily.....	300
Boyer well, John Starr farm, struck in July, '73, now producing daily.....	300

Capt. Grace No. 2, John Starr farm, struck in July, '73, now producing daily..... 300
Percy & Beck well, John Starr farm, struck in July, '73, now producing daily..... 250
Brawley well, Jerry Starr farm, struck in July, '73, now producing daily..... 300
Captain Jack well, Harper farm, struck in July, '73, now producing daily..... 200
Dean well, Harper farm, struck in August, '73, now producing daily..... 300
Modoc well, Troutman farm, owned by Hope Oil Co., struck in August, '73, now producing daily 300
W. W. Thompson well, Morrow farm, struck in August, '73, now producing daily..... 350
Fleming well No. 1, Ralston farm, struck September 6, '73, at first produced at the rate of 700 barrels, and is now producing daily.. 500
Fleming No. 2, Ralston farm, struck September 6, 1873, flowed at the same rate as No. 1, and is now doing daily..... 500
Tip Top well on the Troutman farm, started up at 700 on September 7, '73, and is now producing daily 500
Phillips and Vandall well on the Harper farm, struck September 1, '73, and started at 500 barrels, is now doing daily..... 300
Phillips well on the Sutton farm, struck on the first of September, '73, commenced at 500 barrels, and is now doing..... 300
Miller well on the Troutman farm, struck September 3, '73, commenced at 500, and is now doing daily 350
Gordon well, on the McClelland farm, struck August 28, '73, commenced at 350 and is now doing 200
Columbia well, on the Columbia Oil Co.'s tract, struck September 7, '73, commenced at 350, and is now producing daily..... 225
The Markham and Jock well, struck September 11, '73, produced daily..... 500
Capt. Grace well No. 3, on the Starr farm, was finished on the 4th of September, '73, the well filled with salt water, which was cased off and pumping commenced, which is now producing daily 150

These wells are situated in the Modoc district, and all, with one exception—the Grace well No. 2—are flowing, making a grand total daily production of 7,033 barrels.

The gas well on the Banks farm in the famous district is supposed by many to have a greater flow than the famous Newton gas well, near Titusville. It was struck about the 5th of August, and a volume of gas has ever since been pouring forth, with a noise like "the rush of mighty waters." An attempt was made to lower the tools into the well, but the tremendous force of gas forced them out of the hole.

There are about 75 wells going down in this district, principally on the Troutman, Ralston, Starr, Sutton, Harper, Grover, McClurg and Brown farms, embracing an area of 1,000 acres. All these wells flow through the casing, not one of them having been tubed. No sooner do the tools strike the sand rock than the oil spouts forth. A contrivance on the top of the casing having been provided, the oil is allowed to flow undisturbed. The depth of the wells in this district average 1,500 feet. The oil bearing sand is from 12 to 15 feet in thickness, being pebbly and porous.

The Starr farm is now owned by Phillips Bros., of Parker's Landing, Pa., having been recently purchased by them for the sum of $100,000.

GREECE CITY DISTRICT.

The first well struck in the Greece City district was the Morrison well on the 24th of August, 1872, on the Jameson farm, which flowed at the rate of 250 barrels a day for four months. It then gradually fell off and is now producing 40 barrels per day. S. D. Karns struck the next well, the Dogley, on the 25th of December, 1872. This well is situated half a mile below the Morrison well. It flowed liberally for several weeks, and is now pumped, producing in moderate quantities. A third well was put down by the same gentleman with what result we could not ascertain. The fourth well, owned by John Preston, was struck on the 12th of January, 1873, and began flowing at the rate of 130 barrels per day, and is at present (September, 1873) yielding oil in paying quantities. Numbers of others followed in close succession during the latter part of February and through March and April. Some of these started off very largely; a fair percentage never yielded above 25 barrels per day, while all fell off after the first spurt.

The greatest number of wells producing at this point at any time did not exceed 35. The largest daily production never stood above 1,200 barrels daily, and this occurred during the months of February, March, April and May of the present year. At present the production is about 300 barrels per day. No new wells are going down here.

MILLERSTOWN DISTRICT.

The first well struck in the Millerstown district was the Shreve well on the Stewart farm, in March of this year, which produced at the start 150 barrels per day, and is now doing 125 barrels per day. Next came the Dr. James well on the Barnhart farm, which was struck in May, and started off at 150 barrels, and is now doing 130 barrels per day.

The Lambing well followed and produced 100 barrels per day, and is now doing 50 barrels. This well produced a large amount of gas, and is situated on the Barnhart farm.

The Howe and Clark well on the McDermott farm next followed and produced at the rate of 125 barrels, and continues to produce 75 barrels per day.

The Green well on the Johnston farm never penetrated the third sand. About the first of August the Wolf well commenced flowing at 150 barrels per day. It is situated on the Barnhart farm and continues to produce at the above rate.

The Carlien and Mosier well on the McDermott farm began at the rate of 150 barrels on the 21st of August and continues at about the same rate. The Preston well on the McKinney Bros. and Gaily tract, was struck on the 10th of August, and on striking the oil rock was burned down. It is now pumping at the rate of 100 barrels per day.

The Parsons well on the McKinney Bros and Gaily tract was struck on the first of September and flowed at the start 250 barrels per day is now flowing 200 barrels.

Dr. J. McMichael or Salsbury well, on the McDermott farm, started at 125, and is now doing 75 barrels per day.

The Farquar well, on the Farquar farm, one mile southeast of Millerstown, was struck on the 20th of August, and is now flowing 250 barrels per day.

The Salsbury well No. 2, owned by Dr. McMichael, was struck on the first of September and started at the rate of 300 barrels per day, continuing to do about the same rate.

The Dubenspeck well on the Dubenspeck farm, adjoining the McDermot farm, was struck on the first of September, 1873, and flowed 300 barrels per day. No perceptible reduction is noticeable at the present writing.

A new well on the Abidiah Barnhart farm was struck on the 10th of September, 1873, and is flowing 100 barrels.

The Kepler well, on the Kepler farm, struck on the 10th of September, 1873, is flowing 200 barrels per day.

The Hulings well on the Barnhart farm is in the sand and flowing in large quantities. (September 11.)

The Shidemantle well on the Dubenspeck farm began flowing (September 11, 1873) at the rate of 250 barrels per day.

PETROLIA DISTRICT.

The first wells in the Petrolia district were put down by Messrs. Dimick, Nesbitt & Co., in November and December, 1871, on the Sheakley farm, which attracted considerable attention from operators. These wells proved quite remunerative, but it was not till April of 1872 that the first great strike was made at Petrolia, then a rural district. Early in April, 1872, Dimick, Nesbitt & Co., finished the Fanny Jane well, which yielded liberally for a time. This successful venture was attended with the usual result, and forthwith began a regular rush for the latest oil-dorado.

The Blaney farm was purchased by Fisher Bros. for $60,000 and other tracts in the vicinity were either bought at extravagant prices or leased at high rates; houses multiplied rapidly and ere long the infant settlement presented all the bustle and activity characteristic of new oil towns. Large numbers of wells on the Blaney, Wilson, Jamieson and neighboring farms produced in abundance. The wells on the farms above named are but short lived, as with few exceptions they declined materially within a short period, gradually falling off, many of them ceasing to yield in paying quantities six months after their completion.

At present a large number of these wells are shut down in consequence of the low price of oil. At present there are only some five wells going down in this section. No new strikes of consequence to be recorded in the last few months.

KARNS CITY DISTRICT.

The success attending the operations at Petrolia induced operators to extend developments further south and in May, 1872, the Cooper Bros. began on the McClymonds farm. This property is situated on a branch of Bear creek, Fairview township, one mile and a half from Petrolia, and the same distance from Fairview. In June the Coopers, fearing it destined to be a failure, disposed of a well partly down, to S. D. Karns, who drilled a few feet deeper and struck a 100 barrel well. The next was completed by the Coopers and for several weeks this well flowed 200 barrels a day. Other wells soon followed on the J. R. Campbell, Story, Riddell and Kincaid farms. On the 9th of January the famous Salsbury well on the J. B. Campbell farm began to flow at the rate of over 100 barrels per day. This point became at once the center of developments and soon the nucleus of a town was built, which, as before mentioned, in an early part of this chapter, was named after S. D. Karns, and called Karns City. At present operations are at a standstill, only five wells drilling in this section and 43 wells producing; operators rushing to newer and for the present more productive fields. We ought here to remark that a fourth sand has been reached in two wells near Karns City with good results, which discovery is likely to give rise to the deepening of all the small wells on the line of development in the neighborhood of Karns City and Petrolia. The opinion of operators in regard to these two wells differ. Some believe that no oil exists in the fourth sand, while others are of opinion that the reckoning in these two wells is correct.

Passing through Karns City one and a half miles to the south is the Moore, Hepler and Myers farms. The first well struck in this section was on the 31st of January of the present year, which flowed some 200 barrels per day. Another was struck soon afterwards, which proved a good well. Mr. C. D. Angell, the owner of the Moore and Hepler farms, has now five producing wells doing 500 barrels per day ,and five new wells going down.

A new town has sprung up on this property, called in honor of the owner Angelica. Extensive operations are in progress at Fairview and Angelica.

Having now taken a cursory glance at the present state of developments and given initial operations at different points of interest, we will bring this chapter to a close.

The importance of this lower oil field must be evident to all conversant with the history of its steady development; but we would here say that with this rapid progress of developments a large and very extensive scope of territory has been left behind untouched and undeveloped. Oil men pushed ahead, only desiring to make great conquests in the way of flowing wells. That portion of the field which has been left

in the rear has only been skimmed, but will most assuredly be once again opened up, and again become the scene of fortunes made and fortunes lost.

At the present moment there are in this lower oil field no less than 28 flowing wells, producing the enormous sum total of 8,833 barrels, giving an average production to each well of 315 barrels .

DISCOVERY OF THE FOURTH SAND ROCK.

We have already mentioned briefly the discovery of a fourth sand, or oil rock, in the vicinity of Karns City. It was first found by Mr. Charles Stewart, a native of Butler county. He purchased an abandoned well on the Scott farm, near Karns City, and after a month's vain effort to make it pay as a pumping well, resolved to sink it deeper. He began this labor about the middle of June last, and after nearly eight weeks drilling in daylight struck the first flowing well in the fourth sand. This well is known as the Banks or Stewart well, and averages 400 barrels daily. The entire oil community, including the shrewdest operators, scouted the idea of this being the fourth sand and claimed that the well had not originally been drilled deep enough. Messrs. Tack and Morehead, however, on the adjoining farm, commenced to drill one of their abandoned wells, known as the McCleer No. 1, about four weeks ago, and struck the fourth sand on the 15th of September, when the well commenced flowing at the rate of 700 barrels a day. The most experienced operators claim that the fourth sand is only prolific at these points, where a spur branches out from the main belt, and this is evidently the spur of the Modoc belt. This theory will be very fully studied within the next 60 or 90 days, as there is a determination on the part of everybody owning an abandoned or non-paying well to try it. The fourth sand thus far developed is from 65 to 75 feet below the third sand and is of excellent quality.

THE OIL FIELDS OF CANADA

IN 1873.

THE CANADA OIL REGIONS.

The first discovery of petroleum oil in Canada was made in the township of Enniskillen, in the county of Lamberton, in the extreme western section of the province of Ontario.

Among the settlers on the almost barren and unproductive soil of this section of the county was a lean, swaggy down easter named Shaw, who had emigrated thither from the state of Massachusetts about the year 1836. Shaw is represented as being luckless, thriftless and poverty stricken to the last degree. He had ever been considered a visionary, a schemer of impracticable projects and many were the undertakings which he broached to his friends and neighbors, only to be laughed at. In the years 1855-6 he set the seal to his reputation as a demented visionary by his vain endeavors to get up a stock company for the purpose of boring down through the swamps with a view to extracting from the bowels of the earth a substance which he averred existed there in exhaustless quantities. He waxed eloquent on this theme and declared his conviction that beneath the barren marshes, a source of untold wealth lay hidden. By these and similar wild representations Mr. Shaw ere long came to be regarded as a lunatic. He was wondered at by some, abused by others, and laughed at for a fool by all.

It must be premised that ever since the original settlement of Enniskillen, a dark oily substance had been observed by the settlers floating on the surface of the water in the creeks and swamps. Good water was not to be had. No matter how deep the wells were dug, the water was brackish and ill smelling, and in some localities totally unfit for use; while a surface of black, oily slime frequently arose an inch thick, as cream rises on new milk. Here and there in the forest the ground consisted of a gummy, oderiferous, tar colored mud, of the consistency of putty. These places were known by the name of gum beds, and in two or three instances were of considerable extent. At the present day such surface indications as these would reveal the secret to the most casual observer. But to the primitive, untutored minds of the then residents of the township they failed to convey any other impression than that their lines had not fallen in very pleasant places.

Finding it impossible to arouse any enthusiasm, or get up any agitation on the subject, Shaw quietly subsided into his normal condition of mental torpidity, in which condition he remained until the summer of the year 1857, when he was seized by another of his intermittent attacks of enterprise, and this time he determined to commence operations on his own account. He inaugurated proceedings by digging an ordinary well as if for water, in a hollow about a hundred yards from his dwelling. He worked away at intervals for some days without attracting any notice, and without assistance from any one. Finally he was one day aroused while eating his dinner by a loud explosion, accompanied by what seemed to be the shock of an earthquake. Upon running out to ascertain the nature of the disturbance, he perceived a huge fountain of what seemed to be black mud bursting with great violence from the hole where he had been digging. The mud emitted a very offensive smell. The jet when he first cast his eyes on it, was as nearly as he could judge, about a foot in diameter, and it every moment increased in volume, frequently shooting high up in the air. As a necessary consequence the ground was soon flooded and had not his dwelling been built on an elevation, considerably higher than the mouth of the well, it would have been partially submerged.

Upon examination, the substance thus ejected proved to be crude petroleum. The well continued to flow, with brief cessations, for upwards of 67 hours, and this in a large and swift stream, which poured into the adjoining creek, and the contents were thus carried away and lost. The neighbors for miles around came and lent their assistance; but of course, owing to the

want of tanks and barrels, only a very inconsiderable quantity could be preserved.

The neighboring proprietors followed Mr. Shaw's example and leased portions of their lands to the highest bidders. In an inconceivably short space of time enterprising operators from all parts of Canada and the adjoining republic began to pour in. The needy denizens of the Enniskillen swamps began to realize the fact that their slimy morasses migh tbe confidently counted on to yield a revenue such as could never be hoped for from the richest and best cultivated agricultural soil in America. Land changed hands rapidly, and from $1,000 to $2,500 an acre was paid for territory which, previous to the great discovery, could hardly have been given away. The more common method resorted to, however, was not to transfer the fee simple of the lands, but to grant oil leases thereof, whereby the lessee acquired the exclusive right to operate for oil upon the land for a specified number of years, in consideration of which privilege a certain sum of money—usually several hundreds of dollars per acre—was paid down to the lessor, who, by the terms of the instrument, was further to receive a percentage—generally one-third—of the oil produced, called a royalty. Stores, taverns and dwelling houses sprang up all around with marvelous celerity, forming a village, to which the name of Oil Springs was given. Postal and telegraphic communication was shortly afterwards granted, passable roads were constructed connecting the region with civilization, and for some time all went merry as a marriage bell. The supply of oil was supposed to be almost inexhaustible; but it was soon found necessary to spend much more time, and to incur much greater expense ,than Shaw and his immediate successors had been compelled to do. In other words, the wells would not flow, but had to be pumped, and it became necessary not only to sink a surface well down to the rock, but to bore by means of the drill through the rock until the vein was reached; whereupon oil was said to be "struck." Frequently a vein of water instead of oil would be struck, which had to be exhausted before operations could be proceeded with, and this sometimes occasioned great delay.

Meanwhile, Mr. Shaw was regarded as a public benefactor, and received as great credit as if he had discovered the philosopher's stone. He found himself in possession of enormous wealth, arising partly from the lease of his lands and the royalties therefrom; but chiefly from the product of his wells, the first of which continued to yield from 300 to 600 barrels daily. The market fluctuated considerably; but oil seldom brought less than $6 per barrel at the well. and was generally much higher. For two days it reached the enormous figure of $16.25.

Mr. Shaw, through injudicious speculation, spent all his splendid fortune. He came to the Pennsylvania oil region in 1868 and was employed as a common day laborer at Titusville up to 1870, at which place he died broken hearted and quite unknown.

About 30 miles to the south of Oil Springs, near the village of Bothwell, another large vein of oil was struck, and ere long a busy community sprang up there, scores of wells were put down, and fortunes made and lost. Oil was soon after discovered five miles north of Oil Springs, to which place was given the suggestive name of Petrolia.

In the year 1864 Oil Springs contained a population of more than 3,000 inhabitants, several spacious and well conducted hotels, and at least a dozen or more places of entertainment, which could lay no claim to remarkable distinction. It moreover contained two private banking houses, a board of trade, a printing office, and weekly newspaper, and 247 wells, all in active operation, yielding a large number of barrels per diem, and more were being put down. Money was plentiful, and gambling was practiced on a scale which, for Canada, might well be pronounced gigantic. Every night, Sunday night not excepted, was consecrated to the unholy rites of poker and euchre. Dancing assemblies were formed, tri-weekly fandangoes were held, and the whole place presented the appearance of a California in miniature. But the end was not very far distant. Already the deposit had indicated tolerable palpable symptoms of exhaustion. The Shaw well, after having yielded a sum total of 30,000 barrels—and this in addition to the immense quantity which was lost, as already described—suddenly collapsed and refused to yield another drop. The Twenty Friends well, which was second only in importance to Shaw's, followed the example of its predecessor; and a gradual falling off was perceptible throughout the entire district. Towards the end of the year Hendrick's well revived the hopes of the operators somewhat by a daily yield of 700 barrels for about a week; but in the course of a fortnight these 700 barrels were reduced to from 30 to 40, and shortly afterwards to 15. Operators could no longer count with certainty upon striking a vein of oil wherever they chose to bore, and many wells had to be abandoned as dry holes. Many even of the yielding wells did not produce oil in paying quantities. About this time charlatans professing to be endowed with the mystery of the divining rod made their appearance on the scene, and though laughed at and condemned by nine-tenths of the operators, they contrived to realize something more than a good livelihood out of the other tenth. Success generally followed their predictions, even when dry holes were becoming alarmingly numerous in the district; but of course the secret lay in their former extensive experience of surface indications in Pennsylvania. They could form something more than a plausible guess as to where oil was to be found, but their science gave them no information as to the quantity; and the wells sunk by their directions generally exhausted themselves in a day or two from the time the vein was struck.

Though Western Pennsylvania has produced numerous flowing wells of wonderful capacity, there is no quarter of the world where the production attained such prodigious dimensions as in 1862, on Black creek, in the township of Enniskillen. The first flowing well was struck there on January 11, 1862, and before October not less than 35 wells had commenced to drain a store house, which provident nature had occupied untold thousands of years in filling for the uses—not for the amusement—of man. There was no use for the oil at that time. The price had fallen to 10 cents per barrel. The unsophisticated settlers of that wild and

wooded region seemed inspired by an infatuation. Without an object save the gratification of their curiosity at the unwonted sight of a combustible fluid pouring out of the bosom of the earth, they seemed to vie with each other in plying their hastily and rudely erected spring poles to work the drill that was almost sure to burst, at a depth of a hundred feet, into a prison of petroleum. Some of these wells flowed 300 and 600 barrels per day. Others flowed 1,000, 2,000 and 3,000 barrels per day. Three flowed, severally, 6,000 barrels per day; and the Black and Matthewson well flowed 7,500 barrels per day. Three years later that oil would have brought $10 per barrel in gold. Now, its escape was the mere pastime of full grown boys. It floated on the waters of Black creek to the depth of six inches, and formed a film on the surface of Lake Erie. At length the stream of oil became ignited, and the column of flame raged down the winding of the creek in a style of such fearful grandeur as to admonish the Canadian squatter of the danger, no less than the inutility of his oleaginous pastimes. From detailed determinations Professor Winchell says, "I have ascertained that during the spring and summer of 1862 not less than 5,000,000 barrels of oil floated off on the water of Black creek—a national fortune totally wasted."

The extent of the field is very great if we include every place where oil is found. Reckoning in that way, a district of 200 square miles would not more than cover it. Most of these places, however, present only oozings from limestone rocks, such as occur in various other places in the world unconnected with qualities of any practical value.

The region of value, as developed by actual borings to this time, and the existence of the proper rock, is confined to the western part of the Dominion, and extends from near Lake Erie to Lake Huron, and from the St .Clair river eastward 75 miles or more; thus being about 50 miles north and south by, say, 100 east and west. Its outside lines are somewhat irregular, but such is the general range of it. The part of practical value is, thus far, limited to the "carniferous limestone" (so called from containing nodules of flint resembling a harp) and which is mostly confined to the southern part of Canada.

Within this range Petrolia, Bothwell and Oil Springs have produced nearly all the oil. The latter had the largest wells, though the former now produces more than nine-tenths of present amount. Petrolia is about 16 miles southeast of the outlet of Lake Huron, Oil Springs seven miles south of that, and Bothwell about 35 miles from that.

The surface of the country above described is nearly level, except where the ground descends to the bed of streams, and being largely covered with a dense forest of hardwood trees, is often wet and muddy, and in a rainy season would wonderfully help a traveler to appreciate the "slough of despond." Time, muscle and money will cure this, however, and while the timber now keeps out the drying process of the sun, it is furnishing most valuable fuel for the oil wells.

Western Canada has no coal. The land descends gently to the southwest and the general dip of all the rock formations is westerly.

In drilling the first thing found is a yellow clay, and sometimes sandy soil, five to 15 feet deep. Next a pact of blue clay of even consistency and appearance, from 50 to 100 feet deep. This rests on a thin shell of limestone, resembling a stalactite formation, which seems to have been crystalized out of the water as it drained from the clay into the next bed below, which is composed of gravel from two to eight feet thick. Next comes a slate rock called Hamilton shale, usually 15 feet thick, in the region of good wells, and thinning out to nothing eastward. The surface wells, formerly so productive, were found in this gravel, held down by the clay and thin limestone; and when in digging the pick broke through this thin shell the oil and gas would rush up so rapidly the laborer would often be compelled literally to flee for his life.

Next below the shale lies the carniferous limestone already referred to, the upper layer of which is about 40 feet thick. This alternates with 30 to 50 feet of slate; then comes about 40 feet more of limestone, then a similar amount of slate again, and then (being now at the depth of about 250 feet from the surface), is again found the limestone, which continues 250 feet more, making a total of about 500 feet. All the oil is found within that range, being regularly in veins in the limestone, and the deeper the veins usually the larger. All the rocks below the clay are more or less saturated with it. Next below the oil bearing limestone is a stratum of hard blue limestone, averaging four feet thick, and immediately underneath that a vein of salt water apparently inexhaustible.

At this point commences, with few exceptions in the oil regions what is called the Onondaga salt group, which is a formation of unknown thickness, and in which is found the salt of Syracuse, N. Y., and also of Goderich, on Lake Huron, at a depth of 1,000 feet. It has been penetrated 500 feet in several places near Petrolia without producing a barrel of oil.

To prevent mistake, we ought to say that the salt of Western Virginia is taken from quite another formation, lying geologically much higher, and coming very near the coal, being the conglomerate of the coal measures. In some places, as near Oil Springs, the upper strata seem thinner, and the lower thicker, thus bringing the oil bearing part nearer the surface, giving rise to large surface wells, and also to the gum beds there, which resemble the residuum after the oil has evaporated or been drawn off, leaving a black deposit like asphalt covering, in one or two instances, a hundred acres.

The oil bearing limestone varies from a close compact structure to quite open, and these characteristics are presented often in bands or belts, and the best wells are expected where the rock is most open. In all its parts it is largely composed of marine shells and other fossils peculiar to that geological horizon. This seems to have strengthened the theory of the animal origin of the oil. The thought is quite romantic—perhaps poetic—that the little animals which occupied these shells ages before men appeared, unwilling to be of no use in the future, built up the rocks out of the ruins of their dwellings, and then, by some subtle chemistry, allowed their substance to be converted into oil to fill them, and thus, with true charity, even "gave

their bodies to be burned." Other facts, however, point to other causes of the oil, at least in a majority of cases.

The rocks of Canada, it will be seen, differ widely from those of Venango county, Pa., these being almost exclusively limestone, and others sandstone, alternating with slate.

The odor of the oil is rather unpleasant, and this arises from the sulphur and other substances often found in limestone. Sulphuric acid occurs occasionally in the water, corroding tools and tubing, and sulphuret of iron is found in the rock. Its decompositions and recompositions are taken up by the oil. An English deodorizing process called Allen's is now effectually used. The gravity of the oil varies from 33 to 43 degrees Beaume. Refining produces about 80 per cent of illuminating fluid, with less benzine and more tar than Pennsylvania oil. The color of the crude is dark green, shading into black. Very little paraffine is deposited in pumping, and benzine in wells is rarely used. Casing six inches in diameter is put down to 280 feet, or say 30 feet into the hard limestone, which shuts off fresh water and prevents the soft shale rock from caving. Tankage of the oil is accomplished in part by the use of wooden tanks, but mostly by making use of the blue clay above described. It is found to be almost impervious to water and quite so to oil. Excavations are made in it from 10 to 20 feet in diameter and sometimes 75 feet in depth. Curbing is used to prevent the possibility of caving. The top of the excavation is planked and covered with earth. Here is stored the oil, both crude and refined, free from waste and safe from danger until wanted, when it is pumped out, sometimes by engines and sometimes by spring poles. This blue clay, which the farmers in some parts of northern Ohio and elsewhere regard with exceeding dislike, is here one of the best friends of the oil producer.

Exhaustion of the oil is not to be anticipated for several generations. Enough is produced for the presnet wants of the Dominion, and as Canada develops and her population increases upon the surface, the regions below will respond to their wants. Nature does not display all her treasures at once, but opens one storehouse after another as man's needs may require.

Glaciers, it is quite evident, once moved over that country, for whenever excavations are made down to the solid rock scratches and grooves are found, varying from mere lines to the size of 15 inches, and nearly all running in a uniform course of northeast to southwest. They dip up under Lake Erie and appear along its southern shore, where they have been seen often, even larger than any found in Canada. Icebergs have also floated over the same sections, and evidences of both are abundant from New England to the Mississippi and beyond, and from Lake Superior nearly to the southern lakes.

By these and similar means were many of the Pennsylvania hills torn down and valleys formed, and from these sources came most of the soil, gravel and boulders scattered along the Oil creek country. Their home was in the north. It seems wonderful that in all the tumults, earthquakes and upheavals of the past nothing has been permitted to disturb the oil, though it has been left comparatively near the surface and easily accessible to man.

FOREIGN OIL FIELDS.

SOUTH AMERICAN OIL FIELDS IN 1873.

Much attention has of late been directed to this field. Peru, Ecuador, Bolivia and Chili offer inducements to speculators in search for oil, but only in the two first named countries are the prospects of such a character as to attract foreign capital for the present. The existence of oil in Peru and Ecuador has been known as far back as the tradition of these countries reached, but to a certainty it has been made use of for at least 250 years, by the Spaniards, the first conquerors of the Peruvian empire, which included Ecuador), for making pitch. The oil was collected in a manner similar to that employed by the Seneca Indians to obtain the petroleum of Oil creek, viz, shallow pits were dug and the oil which collected was skimmed from the surface and was then allowed to evaporate under the heat of a tropical sun till it became of a thick, glutinous consistency, when it was removed and boiled down to a hard pitch. This pitch was used for coating the inside of earthenware and particularly aguardienti or liquor jars. The Spanish government long held a monopoly of this trade, which yielded an annual profit of $35,000. That portion of the South American oil field lying in the neighborhood of the town of Payta, on the river Achira, was purchased by a Mr. Lama in the year 1830, who worked the mines or pits after the primitive mode. In 1868 a Mr. Blanchard C. Dean in prospecting along the coast discovered the works of the Lamas, and proposed a partnership agreement with them, and a joint prosecution of the work. They refused. He then "denounced" a mine according to the old Spanish mining laws, which resulted in a law suit. The proceeding is this: Any person who may have discovered a mine or vein of any metals, or as the Peruvian mining laws say, juices of the earth, can present himself before the mining tribunal and demand possession of said vein. The discoverer or claimant is called the denouncer. The tribunal then awards him the possession of a piece of ground containing the vein 200 yards long and of the same width. Within 90 days he is obliged to commence work. He must dig a pit at least 10 feet deep by the same in length and width. When this is completed his next duty is to publish in the nearest daily papers for 30 days in succession, calling and asking if there be any person or persons who can show a better right to the discovery. Within these 30 days he must post handbills in the village nearest the mine, and within the jurisdiction of the mining tribunal making his award, bearing the same import. If no opposition is made or sustained, then the tribunal decrees the ownership and title to the denouncer, and that the former owner of the ground shall receive from the denouncer payment therefor at a price reckoned without the added value of the mine.

Mr. Rollin Thorne, a resident of Lima, assisted Mr. Blanchard in the litigation and won the suit, and possession of the land, which in extent is 31 miles in length and six in width.

Within the past year the courts of Peru have decided that petroleum is not denouncable. Happily for the Messrs. Thorne, who obtained their best oil territory by this means, the Peruvian law will not allow a decision already made to be affected by any subsequent one.

The Peruvian oil field is a belt on the west coast of South America, running along the 30th parallel of longitude, between Point Aguja on the south, or needle point, and the town of Tumbez on the north and about seven degrees south of the equator. The known distance is about 251 miles, running north and south along the Pacific coast, and about 150 miles inland to the Andes. It is a singular coincidence that the oil belt corresponds with the oil regions of Pennsylvania, as both are intersected by the 80th degree of longitude. The topographical structure of the Peruvian territory is broken and mountainous, and has evidently been subjected to volcanic action. It is also worthy of note that the mountain range of the Andes to the east, contains large deposits of anthracite coal, and that this coal deposit is about the same distance from the oil field of Peru as our Allegheny anthracite deposit is from the Pennsylvania oil region. A coating of sand about eight inches thick covers the entire surface of the Peruvian oil field. A fossiliferous deposit of marine remains is found on the surrounding hills, from 250 to 300 feet above the level of the sea. The same deposits are also found on the bottom lands, which proves that this part of the continent has at some period of time been covered by the sea. The oil belt appears to belong to the tertiary formation. The outcroppings of sand rock are to be met with everywhere as we find them in Pennsylvania. Shale exists below the top coating of the sand, and is completely saturated with oil, which, to say the least, is a good surface indication. The shale varies from 30 to 40 feet in thickness. These strata of shale are interlined with thin lamina of bluish gray sand rock, of a fine texture. The first sand rock is to be found at a depth of from 130 to 132 feet, and is from five to ten feet thick. The second sand rock is found at 300 feet, and the third has not yet been reached, as no well has been sunk to a greater depth than 350 feet.

In 1871 Messrs. Rollin, Thorne & Co. commenced drilling with a common pod auger. Three wells were drilled and oil was found in very considerable quantities at very shallow depths, viz, 226, 56 and 38 feet. Other wells followed with good results. In July, of last year, a new well was commenced at Point Pavinas and drilled to a depth of 351 feet, or 51 feet in the second sand, through which the tools have never yet penetrated. No crevice was perceptible to the driller, as a volume of gas and oil at this depth was suddenly ejected from the well, compelling the abandonment of the drilling. The well was finally tubed, and both valves and sucker rods put in to diminish the flow, which was calculated at 1,000 barrels per day. The well is now flowing 250 barrels per day with the lower valve in. From all the wells struck on this territory great volumes of gas continually issue. The gravity of the oil is from 40 to 50 degrees Beaume. In color it is a little darker than Pennsylvania oil, and it has the same odor as an oil of the same gravity. It yields from 70 to 75 per cent of 110 fire test kerosene when refined, and is a superior article.

A contract has been entered into with Messrs. R. Thorne & Co. by an Anglo-Peruvian firm for 200 barrels crude oil per day at $5 gold extending over a long period. This firm is now building a refinery of 200 barrels capacity at the point of operation.

In the year 1864 Messrs. G. H. Bissell and James Bishop, of the city of New York, leased of Don Diego Lama his estate of Prancora, consisting of 4,500,000 acres. A company called the Peruvian Oil Company was formed, with capital of $5,000,000. Operations were soon commenced by the company on the northern portion of the tract at Zorritos, 20 miles south of the Tumbez river, immediately on the coast.

This company has put down a number of wells with good success. In the early part of 1868 the company struck a well which produced 300 barrels per day for nearly a year, when it caved in and the production ceased. The company refine their own oil and find a ready market for this product on the Pacific coast, Australia and New Zealand. The president of the company is Mr. Geo. H. Bissell.

In one well on the company's lands the following is the order in which the rocks are found: Soapstone and slate, sand rock and slate, conglomerate limestone, hydrate of iron or reddle, cretaceous sandstone, carboniferous slate, gravel pebble in which the oil was found. Oil was met at 18 feet.

ECUADOR OIL FIELDS IN 1873.

The oil fields of Santa Elena, in the Republic of Ecuador, are spoken of in the following terms by Raymond De Peiger, engineer and geologist to the government of Ecuador, in his report to the president of the republic. He says:

"Petroleum is to be found in the country in very large quantities. On a surface of about four square leagues from the sulphurous spring of San Vicente to the sea shore the wells have been sunk, and the bituminous matter obtained in a liquid state. Its consistence is not the same in the different wells. In some of them it is fluid, like whale oil; in others it has the consistence of butter at ordinary temperature. At the surface ,or upper part of many wells, it can be seen in hard, compact masses, which probably have been formed by the evaporation of the liquid. This oil has a dark brownish color, which gets darker with the greater consistence of the oil. In one place where it oozes from the bed of a dried stream, the bituminous matter has a greenish color. Its smell is not disagreeable, which is generally the case with many of the American and especially the Canadian oils. As the inhabitants have neither the knowledge nor the implements required, the works are very rude. Pits from 10 to 12 feet deep are dug into the sand till the clay

is reached and when the oil, which oozes from all sides has filled them it is dipped out.

"Near the wells are primitive furnaces, built with sun dried clay, on which are open iron boilers. The bituminous matter is thrown into these vases and cooked until all the volatile products disappear and leave a thick pitch.

"In * * * Santa Elena it is not admissible to suppose that petroleum has been formed in the upper sandy deposits. Its presence there can only be explained by the escape of the bituminous matter from the fissures in which it was contained. * * * We may then safely admit that, although large quantities of oil are to be found in the sand, it is only the mere waste of the real springs. Deeper sinking will without any doubt be very profitable and yield immense proportions of petroleum.

"Their proximity to the sea is another advantatge of these mines. While great difficulties have been encountered in the United States for the conveyance of the oil to the seaboard, here it may be conducted at small expense from the wells to the port of Santa Elena, by means of pipes if the crude oil is exported.

"Although I should think that it would be more profitable to refine at the place of production, the advantage expressed remains the same.

"By this extent, by the enormous quantities of petroleum that they contain, and by the short distance which lies between them and the sea, these mines have a real value. Intelligent capitalists will promptly appreciate it and works will soon be established.

"By building refineries at Santa Elena enough kerosene might be produced for the use of the country, and for the markets of the neighboring republics."

What has been said of the topography and geology of the Peruvian field applies with equal force to that of Santa Elena. The climate of this region, though situated almost directly under the equator, is mild and salubrious, owing to the elevation of the country and its proximity to the Pacific, the cool breezes of the ocean exercising a favorable influence on the temperature. In the coldest season it is never below 50 degrees, and in the hottest never above 85 degrees.

These discoveries and these developments are destined to exercise a potent influence on the future of the trade of Peru and Ecuador. A powerful competition will be offered to Pennsylvania in the markets of Europe, Australia and New Zealand, while in the republics of Central and South America it can result in nothing less than entire exclusion.

WEST INDIA ISLANDS.

CUBA IN 1873.

In the early history of Cuba it is recorded that Havana was originally named by the early visitors and settlers Carine—"for there we careened our ships, and we pitched them with the natural tar which we found lying in abundance on the shores of the beautiful bay." Petroleum springs are in number near Havana, rising from fissures in the serpentine rocks at Guanabacoa, and have been known for two centuries. Allan's Manual of Mineralogy says the whole of Cuba is impregnated with bituminous matter to a surprising degree, in cells and cavities in the rocks. The Essai Politique sur l'Isle de Cuba: "Petroleum leaks out in some, indeed, in numberless places in this delightful island, from amidst the fissures of the serpentine, and perhaps has deeply seated sources. We are acquainted with abundant springs of petroleum between Holquin and Mayari in the eastern end of the island, and also possess notices in the direction of Santiago de Cuba."

SANTO DOMINGO.

On a stream called El Aguatediondo, or stinking water, three miles north of the town of Azua, this spring makes its appearance as a stagnant, torpid pool, exuding slowly through a heavy gravel deposit. A very small area in the vicinity is covered with deposits of pitch. For half a mile down the bed of a rain water stream the gravel or sand as the case may be is more or less cemented by an impure pitch, sometimes plastic, oftener hardened to asphaltum. The pools of the spring and neighboring excavations contain a dirty water rendered brown by contact with the oil and on the surface is a thin scum of petroleum, dark brownish green to reflected light and a reddish brown by transmitted light. An attempt was made during the recent oil excitement of 1865 to bore here. The usual tools were taken to the spot, but the undertaking was eventually abandoned. In the driving pipe yet remaining at the mouth of the well, may be observed an accumulation of oil through which gas bubbles up. At the distance of a few yards from this well are several jets of gas. Over the whole area there is not a single blade of grass or any other vegetable.

BARDADOES IN 1873.

An American gentleman in business in this island in 1864 visited the oil regions of Pennsylvania, and from his observations became convinced that a like article had been noticed by him oozing out of the rocks and lying on the surface of the ground on some of the plantations of this island, but being engaged in business demanding his entire attention he made no effort to test the facts in regard to it. During the year 1871 a firm on the island quietly commenced to secure it by sinking shafts and curbing as they went down; it was soon found that they shipped considerable oil, and that it was very valuable for lubricating purposes, netting them $30 per barrel on the island. These facts coming to the knowledge of other parties a company was formed and a favorable spot secured on a plantation having abundant surface indications. This company determined to take advantage of the modern Pennsylvania mode of obtaining oil by drilling and pumping. An experienced driller was engaged in Pennsylvania, who was furnished with a full rig—boiler, engine, tools and wood work, and was dispatched to the island. In a letter dated the second of March the driller says: "We have drilled 168 feet, but the

rock is soft soapstone and not hard enough to prevent caving, so we had to abandon the well. We then moved the rig from the ravine to higher ground." After the abandonment of this well it was found that it filled up 75 feet with oil. The second well, for some cause unknown to us, has also been abandoned.

TRINIDAD.

In the island of Trinidad, three-fourths of a mile back from the coast, is a lake called the Tar Lake, a mile and a half in circumference, apparently filled with impure petroleum and asphaltum. The latter, more or less charged in its numerous cavities with liquid bitumen, forms a crust around the margin of the lake and in the center the materials appear to be in a liquid boiling condition. The varieties contain more or less oil, and methods have been devised for extracting this, but the chief useful application of the material seems to be for coating the timbers of ships to protect them from decay. By the patented process of Messrs. Atwood, of New York, the crude tar of that locality, having been twice subjected to distillation and treated with sulphuric acid and afterward with an alkali, is then further purified by the use of permanganate of soda or of potash. Being again distilled it yields an oil of specific gravity of 0.900, which is fluid at 32 degrees Fahr.

THE CARPATHIAN PETROLEUM BELT, 1873.

The existence of rock oil springs and wells in Galicia, Moldavia and Wallachia, outside or along the north, northeast and east foothills of the chain of Alps which surrounds Hungary on the side of Russia, has been known for some years. In 1859 the Austrian geologist, M. Foetterle, wrote of them in the Year Book of the K. K. Geological Institute. In 1866 Hochstetter and Prosepny published further observations in the same annual; and Iicinsky, in the Berg-un-Hutten-wesen-Zeitung, No. 36-37. In No. 39-41, 1866, Prosepny gave another account of them; as Cotta did also in the East Austrian Review. Ellenberger in 1867 added something in the annual K. K. G. R., and M. Coquand inserted his memoir in the xxiv. vol. Bulletin of the French Geological Society.

We have now, however, a completer resume of all that is known on the subject from the pen of M. Emile Heurteau, engineer of mines, in the recently issued third part of the xix. vol. of the annals of the Paris School of Mines, with a map of the Krosno-Dukla districts and sections of the petroleum bearing rocks. He says that in 1869 he visited most of the points where oil was actually sought or obtained, but that the work was conducted by the proprietors of the land, no records of borings were kept, and scarcely any traces of what had been done were left to view.

The mountain range, in this part of it, runs northwest and southeast, and falls off gently to the great Miocene Tertiary plains of Galicia and Moldavia, in a series of parallel anticlinal and synclinal undulations, which are visible in the sections made by all the descending valleys and ravines. The mountain mass consists of cretaceous rocks and outcropping on the southwest flank, covered by Eocene Tertiary sandstones and clay-slate formations, almost vertical or a little overturned, so as to plunge southwestwardly and rarely fossiliferous.

On these Carpathian rocks lie the Miocene Tertiaries, the lowest of which, outcropping all along the foothills, are the two thin beds of saliferous clay-slates which furnish the salines of the region. The salt mines of Weilisk and Bochnia, the gypsum masses of Podgorze, and the sulphur deposit in the gypseous marls of Schloszowice, are all in the Miocene.

Everywhere along the range of the salt bearing rocks is a blackish clay marl bed, more or less bituminous, of muddy consistency, strongly impregnated with salt, either crystallized in large grains imbedded in the mass, or condensed into large lenticular beds of impure rock salt; or irregularly distributed. The whole saliferous formation is traversed by contorted beds of anhydrite gypsum alternating with beds of salt clay, more or less pure. All stand vertical or plunge deeply south, growing less deep the further down they are followed, puzzling the observer with the appearance of passing underneath the older steeply south dipping rocks of the mountain range. Heavy coverings of moss help the deception. It is of course necessary to suppose a long fault, the northeast country having settled down and curled the edges of its rock formation completely over. This fault is the key to the subject of the memoir.

On the Galician side the oil belt, though extending for 200 miles, is explored at three principal centers—New Saudac on the west, Dukla, Krosno and Sanock in the middle, and Borslau in the east, where the mineral wax ozokerit occurs in great abundance.

From time immemorial the peasants of Bobrka, on the banks of the Jasolka, between Dukla and Krosno, have noticed oil oozing from joints of the sandstone rocks, and standing, especially in dry seasons, on the little pools of water. They collect it to grease their wagons, and fire it off on festival occasions. In 1860 M. Luckasilwitch, hearing of the American petroleum wells, experimented with his own in the laboratory, and then commenced work on M. Klobassa's lands, but with very poor success. In 1861 he transferred his search to a place further east and struck oil in a bore 50 feet deep which yielded 16,000 pounds daily. His second well yielded 600 barrels. Wells multiplied until in 1870 the yield amounted to $70,000 per annum, giving a profit of $50,000. Seventy-seven wells are ranged along the axis of a sharp anticlinal, one-third of a mile long, none being more than 80 feet off the straight line, and the oil from all flows through a pipe to a common reservoir. Some of the wells are 350 feet deep; but no law of depth has been obtained. Shafts seven feet square are sunk about 70 or 80 feet to the sandstone, and bore holes are continued from this downward. Gunpowder is used in shafting and strong ventilating fans blow out the gases. Lights are forbidden and accidents are few. The boring is very rude, being done by four hands without machinery.

On reaching the oil stratum a great quantity of carbonic acid gas mixed with hydro-carbons escapes from

the well, followed by the oil, which rises to the surface of the water, filling the shaft. A small Jewish hand pump is used to draw off the water and oil into barrels, from which the water is allowed to escape by gravity. It is evident that the oil is kept down by the weight of water and must be relieved of this load before it will rise in any quantities. Some wells yield per day 3,000 kilogrammes, others 600, 302 down to 80, and some mere traces of oil. The author gives interesting details of the lawless behavior of the various wells of the group, with diagrams showing their relative situations and relations to the anticlinal axis, and confesses that no trace of a method of explanation has been obtained. The oil is always mixed with water, sometimes fresh, ordinarily saline. Between the two petroleum horizons the water is always salt. The following table shows the authenticated and official statistics of all the oil which has been transported and conveyed by the Carl Ludwig & Kaiser Ferdinand (Nord-Bahn) railroads for eight successive years from the oil regions.

YEAR	Oil conveyed and transported by roads	Into Austrian provinces and Prussia	Consumed in the towns & cities of Galicia	American Oil consumed in Galicia
	cwt.	cwt.	cwt.	cwt.
1862....	32,295	26,725	5,570	.....
1863....	67,336	53,796	13,560	787
1864....	113,099	91,672	21,427	238
1865....	133,356	117,043	16,313	114
1866....	166,349	146,802	19,547	1,552
1867....	155,589	139,059	16,530	395
1868....	147,251	134,535	12,716	297
1869....	81,398	72,701	8,697	.....

The above table will give some idea of the resources of the Galician portion of the Carpathian oil field, as it exhibits how many years the product of this field has been in the market.

A recent traveler says of the Wallachian portion of the Carpathian oil belt that "there is no country in the old world which has been so plainly proved to be a land flowing with petroleum." Associated capital has been brought to bear on its extraction and export, but strange enough the mechanical appliances by which success has been achieved in western Pennsylvania have been but to a very limited extent introduced into Wallachia. The Roumanian petroleum companies, situated on the same end of the Carpathian belt have been contented to adopt the primitive mode of collection in use with the peasantry, by making excavations into the earth, into which the oil saturating the strata flows. This plan of operations is not conducive to profitable commercial working on a large scale, but should attention be given to deep boring on the plan adopted in the oil region of Pennsylvania there is every prospect of success.

In the course of this chapter mention has been made of ozokerit, a mineral wax or solidified petroleum. We consider the matter of so much interest that we give a brief account of this singular product of the field now under notice.

Ozokerit is a mineral wax and in the raw or native state is of a yellowish color, of light specific gravity and somewhat fibrous in its structure. It will not burn of itself, but will readily melt on a light being applied to it. On being roughly wrapped around a central wick, even in its native state, it is easily and readily consumed. In fact, a rude candle can be made of the raw material and a cotton wick. It is found principally in Austria, Moldavia, the Caucasus, and near the Caspian Sea, where it is obtained in great quantities, being largely used in those countries for illuminating purposes. It was discovered about two years since by a Russian military officer, who communicated the fact to a Mr. Gustav Siemssen, who has introduced it into England. In the premises where the candles are made the native ozokerit is found in two conditions—in the one as dug from the earth, and in the other as roughly melted down for convenience of storage and transit. In the latter condition it forms a dark colored mass, and is packed in barrels, the native or unmelted ozokerit being sent over in canvas bags. From the store, the crude material is conveyed into the melting tanks, holding from two to three tons each, where it is melted down by means of a steam coil. From these tanks, which are situated in a gallery some 15 feet above the ground level, the ozokerit is run off by gravitation to a series of stills, placed outside the main building and holding from two to three tons each, into which it is distilled over, partly by steam and partly by bottom heat. The dirt and bottoms from the crude ozokerit are run off from the melting tanks into another series of tanks beneath them, where they are remelted, the finer products being afterwards distilled over. The ozokerit comes from the stills in the form of an oily distillate, which is run from the condensers into molds and allowed to cool. This gives a deep yellowish wax like substance of a spongy nature, the pores being filled with oil, which exudes under a slight pressure. These cakes are packed between oilskins and canvas cloth, and are placed in hydraulic presses, of which there are three of large capacity. The pressed cake after removel is placed into reheating tanks and again melted down, and is pumped from these tanks by a steam pump into the acidifier, where it is treated with sulphuric acid. These acidifiers are steam jacketed, and are fitted with revolving agitators, by which the ozokerit and acid are agitated for a certain time, after which the mixture is allowed to settle. After settling the purified ozokerit is drawn off from the lower part of the acidifiers, the acid remaining on the top, and run into vessels which are heated by bottom heat. This is the final heating, and from these vessels the fine stuff is drawn off into molds, the result being a hard white wax, the melting point of which is 140 degrees, that of paraffin wax being only 128 degrees. These blocks are sent to Messrs. Field's works at Lambeth, London, England, and from them the ozokerit candles are made. There are several by-products, the chief of which is a very clear, colorless oil, and of very high illuminating power.

BURMAH, INDIA, OIL FIELDS.

The petroleum business in Burmah has long been in operation, the oil being used by the natives for heating purposes, for preserving wood and also as a medicine.

Thousands of wells have been excavated and after working them so long as profitable, they were left and new ones dug out. Dry holes are as frequent as in western Pennsylvania, broken down operators as numerous, and lucky ones, who have succeeded in making their first million, just as few. The possession of the royalties of Burmese oil lands are still so valuable as to be deemed the most desirable gifts the sovereign of the country can bestow upon chosen favorites. Not only this, but English capital is largely invested there, and large quantities of the oil finds a ready market in Europe.

The following interesting account of the wells of that distant county is taken from the journal of John Crawford, Esq., F. R. S. F. L. G., and ambassador of the governor general of India to the court of Ava, in 1826. Though his report is of old date, it applies with equal truth to the present state of the business.

"At 3 in the afternoon our whole party proceeded to the celebrated petroleum oil wells. Those which we visited cannot be further than three miles from the village, for we walked to them in 40 minutes. The wells altogether occupy a space of about 16 square miles. The country here is a series of sand hills and ravines, the latter torrents after a fall of rain, as we now experienced, and the former covered with a very thin soil, or altogether bare. The trees, which are more numerous than we looked for, did not rise above 20 feet in height. The surface gave no indication that we could detect of the existence of petroleum. On the spot which we reached were eight or ten wells and we examined one of the best. The shaft was of a square form and its dimensions about four feet to a side. It was formed by sinking a frame of wood composed of the mimosa catechu, which affords a double timber. Our conductor, a son of the Myosugi of the village, informed us that the wells were commonly from 140 to 160 cubits deep, and their greatest depth in any case 200. He informed us that the one we were examining was the private property of his father—that it was considered very productive and that its exact depth was 140 cubits. We measured it with a good lead line and ascertained its depth to be 210 feet, thus corresponding exactly with the reports of our conductor, a matter which we did not look for, considering the extraordinary carelessness of the Burmans in all matters of this description. A pot of oil being taken up and a good thermometer being plunged into it, indicated a temperature of 99 degrees. That of the air when we left the ship an hour before was 82 degrees. We looked into one or two of the wells and could discern the bottom. The liquid seemed as if boiling, but whether from the emission of gaseous fluids or simply from the escape of the oil itself from the ground we had no means of determining. The formation when the wells were sunk consisted of good loose sandstone and blue clay. When the well is dug to a considerable extent the laborers informed us that brown coal was occasionally found. Unfortunately we could obtain no specimens of this mineral on the spot, but I afterward obtained some in the village. The petroleum itself when taken out of the well is of a thin watery consistence, but this, by keeping and in the cold weather it coagulates. Its color at all times is a dirty green and not much unlike that of stagnant water. It has a pungent, aromatic odor, offensive to most people. The wells are worked by the simplest contrivance imaginable. There is over each well a cross beam, supported by two rude stanchions. At the center of the cross beam and embracing it is a hollow revolving cylinder, with a channel to receive a drag rope, to which is suspended a common earthen pot, that is let down into the well, and brought up full, by the assistance of two persons pulling the rope down an inclined place by the side of the well. The contents of the pot are deposited for the time in a cistern. Two persons are employed in receiving the oil, making the whole number of persons engaged on each well only four. The oil is carried to the village on posts in carts, drawn by a pair of bullocks, each cart conveying from 10 to 14 pots of 10 viss each, or from 265 to 371 pounds avoirdupois of the commodity. The proprietors store the oil in their houses and then vend it to the exporters. The price varies according to the demand, from four ticals of flowered silver to six ticals per 1,000 viss; which is from five pence to seven pence half penny per 100. The carriage of so bulky a commodity and the breakage to which pots are so liable enhances the price in the most distant parts to which the article is transported to 50 ticals per 1,000 viss. Sesamun oil will cost at the same place not less than 300 ticals for an equal weight, but it lasts longer, gives a better light and is more agreeable than the petroleum, which in burning emits an immense quantity of black smoke, which soils every object near it. The cheapness, however, of this article is so great that it must be considered as conducing much to the comfort and convenience of the Burmans. Petroleum is used by the Burmans for the purpose of burning in lamps and smearing timber to protect it against insects, especially the white ant, which will not approach it. It is said that about two-thirds of it is used for burning, and that its consumption is universal until its price reaches that of Sesamun oil, the only other oil which is used in the country for burning. Its consumption, therefore, is universal wherever there is water carriage to convey it—that is, in all the country watered by the Krowaddy, its tributary streams and its branches. It includes Bassien, but excludes Martaban, Tavoy and Mergui, Aracan, Tongo and all the northern and southern tributary states. The quantity exported to foreign ports is a mere trifle, not worth noticing. It is considered that a consumption of 30 viss per annum for each family of five and a half persons is a moderate average. If it were practical, therefore, to ascertain the real quantity produced at the wells, we should be possessed of the means of making a tolerable estimate of the inhabitants who make use of this commodity, consisting of the largest part of the population of the kingdom. Of the actual produce of the wells we received accounts not easily reconcilable to each other. The daily produce of the wells was stated according to quality to vary from 35 to 500, the average giving about 235 viss. The number of wells was sometimes as low as 50, and sometimes as high as 400. The average made about 200. Considering that they are spread over 16 square miles, as well as that the oil is well known to be an article of general consumption

throughout the country, I do not think the number exaggerated. This estimate will make the consumers of petroleum for burning amount to 2,066,721. In the narrative of one of my predecessors, Captain Cox, the number of wells is given as high as 520, and the daily average produce of each well is reckoned at 300 viss, which makes the whole amount produced 56,940,000."

We here give extracts in reference to Petroleum from the narrative of Major Michael Symes of the English army, who was sent by the governor general of India as embassador to the court of Ava, in 1765 (published by Bulmer and Co., in London, in 1800), who says:

"After passing various sands and villages we got to Yaynangheoum, or Earth Oil (Petroleum) creek, about two hours past noon. We were informed that the celebrated wells of petroleum, which supply the whole empire and many parts of India with that useful product, were five miles to the east of this place. The mouth of the creek was crowded with large boats waiting to receive a lading of oil, and immense pyramids of earthen jars were raised within and around the village, disposed in the same manner as shot and shells are piled in an arsenal. This is inhabited only by potters, who carry on an extensive manufactory, and find full employment. The smell of the oil is extremely offensive. We saw several thousand jars filled with it, ranged along the bank; some of these were continually breaking and the contents mingling with the sand, formed a very filthy consistence. Mr. Wood had the curiosity to walk to the wells; but, though I had felt the same desire, I thought it prudent to postpone visiting them until my return, when I was likely to have more leisure, and to be less the object of observation.

We rode until 2 o'clock, at which hour we reached Yaynangheoum ,or Petroleum creek, of Benangyun. The oil drawers stated to us that in cleaning out old wells accidents sometimes happened from the fire damp and they pointed out a particular well at which two men had lost their lives from this cause.

The celebrated petroleum wells afford, as I ascertained at Ava, a revenue to the king, or his officers. The wells are private property and belong hereditarily to about 32 individuals. A duty of five parts in 100 is levied on the petroleum as it comes from the wells and the amount realized on it is said to be 25,000 ticals per annum. No less than 20,000 of this goes to contractors, collectors or public officers, and the share of the state, or 5,000, was assigned during our visit as a pension to one of the queens.

The petroleum wells of Renangyorong have been already described in the Journal. From the more accurate information which I obtained at Ava, it appears that the produce of these may be estimated at the highest in round numbers at 22,000,000 of viss, each of 365-100 pounds avoirdupois. This estimate is formed from the report of the Myo Thugyi, who rents the tax on the wells, which is five in a hundred. His annual collection is 25,000 ticals, and he estimated or conjectured that he lost by smuggling 8,000, making the total 33,000. The value of the whole produce, therefore, is 660,000 ticals. The value of the oil on the spot is reckoned at three ticals per 100 viss, and consequently its amount will be as above stated.

I should observe that petroleum is universally used wherever navigation of the Irrawaddy and Ryendwen, with their tributary streams, will allow of its being conveyed, and that it is also carried to a place already noticed in our journey up the river. Dr. Buchanan partook of an early dinner with me and when the sun had descended so low as to no longer inconvenience us, we mounted our horses to visit the celebrated wells that produce the oil, an article of universal use throughout the empire.

The evening being far advanced, we met but few carts. Those we did observe were drawn by a pair of oxen, and of a length disproportionate to the breadth, to allow space for earthen pots that contained the oil.

It was a matter of surprise to us how they could convey such brittle ware with any degree of safety over so rugged a road. Each pot was packed in a separate basket and laid in straw, notwithstanding which precaution the ground all the way was strewn with broken fragments of the vessels and wet with oil, for no care can prevent the fracture of some in every journey. As we approached the pits, which were more distant than we had imagined, the country became less uneven and the soil produced herbage. It was nearly dark when we reached them, and the laborers had retired from work. There seemd to be a great many pits within a small compass. Walking to the nearest we found the aperture about four feet square, and the sides lined as far as we could see down with timber. The oil is drawn up in an iron pot fastened to a rope passed over a wooden cylinder, which revolves on an axis, supported by two upright posts. When the pot is filled two men take hold of the rope by the end and run down a declivity, which is cut in the ground, to a distance equivalent to the depth of the well. Thus, when they reach the end of the track the pot is raised to its proper elevation; the contents, water and oil together, are then discharged into a cistern and the water is afterwards drawn through a hole in the bottom. Our guide, an active, intelligent fellow, went to a neighboring house and procured a well rope, by means of which we were enabled to measure the depth, and ascertained it to be 37 fathoms; but of the quality of the oil at the bottom we could not judge. The owner of the rope, who followed our guide, affirmed that when a pit yielded as much as came up to the waist of a man, it was deemed tolerably productive; if it reached his neck, it was abundant; but that which rose no higher than the knee, was accounted indifferent. When a well is exhausted they restore the spring by cutting deeper in the rock, which is extremely hard in those places where the oil is produced. The government farms out the ground which supplies this useful commodity, and it is again let to adventurers, who dig wells at their own hazard, by which they sometimes gain and often lose, as the labor and expense of digging are considerable. The oil is sold on the spot for a mere trifle—I think 200 or 300 pots for a tackal, or half a crown. The principal charge is incurred by the transportation and purchase of vessels. We had but half gratified our curiosity when it grew dark and our

guide urged us not to remain any longer, as the road was said to be infested with tigers, that prowled about at night among the rocky, uninhabited ways through which we had to pass. We followed his advice and returned with greater risk, as I thought, of breaking our necks from the badness of the road, than of being devoured by wild beasts. At 10 o'clock we reached our boats without misadventure."

PUNJAB, INDIA, OIL FIELDS.

The public works department of the government of India a few years since engaged a gentleman from Pennsylvania, Benjamin Smith Lyman, Esq., to report on the commercial value of the oil lands of the Punjab. Mr. Lyman reports as follows:

The Punjab oil region is in the corner between Cashmere and Cabul, and lies wholly between north latitude 32 degrees 31 minutes and 33 degrees 47 minutes, and east longitude from Greenwich 71 degrees 18 minutes and 73 degrees 5 minutes; a nearly square space about a hundred miles long east and west by ninety miles wide, north and south.

Just inside the northeast corner of this square is Rawul Pindee, the largest town of the region, with about 20,000 inhabitants; just inside the southeast corner is Pind Dadun Khan, a town of about 12,000 inhabitants; and just inside the southwest corner is the ancient uninhabited ruin of a walled town now called Kaffir Kot. Just within the northwest edge of the region, and less than 20 miles from its eastern edge, stands the little village of Shah kee Dheree, on the site of the ancient capital Taxila, where the King Taxiles hospitably entertained Alexander the Great. The small town of Attok, where Alexander crossed the Indus into India is only 10 miles north of the middle of the northern edge of the square. The famous Muneekyala Tope, built by King Kanishka, about the Christian era, to mark the spot where Booddha in compassion gave his own flesh to satisfy the hunger of a starving tiger, stands a little outside the square, 15 miles southeast of Rawul Pindee.

The river Indus enters the square about the middle of the northern edge and leaves it at the southeast corner. The Jhelum river (the "fabulosus Hydaspes) of the ancients), one of the five rivers that gives its name to the Punjab, flows across the southeast corner, past Pind Dadun Khan, southwesterly toward the Indus. The center of the region is drained by the Sohan, which rises near Rawul Pindee and flows west southwest to the Indus.

The region lies, then, mostly between the Indus and Jhelum, in what is called the Sind Sagur Doab (two rivers), and it is mainly in the mountainous or hill part (Kohistan) of the Doab. The oil has been drilled for at Gunda, and at least 50 gallons of it a day were pumped from the well; but the yield, of course, grew quickly less (like the ordinates of a parabola), and after the whole amount had reached 2,000 gallons (about five months) the daily yield was less than 10 gallons. In the region oil flows also at five other natural springs, from a gill to three quarts a day, and there are traces of it at two other places, making eight in all. Asphalt, or dried oil, is found in small quantities at four of these places, and at four other places, at two in notable quantities. At most of the asphalt places there are traces of rock tar or asphalt melted by the heat of the sun; and at one of them (Aluggud) as much as 100 gallons. Besides these dozen places where oil or asphalt is found there are half a dozen places where there are small traces of one or the other, enough to attract notice in the minute examination of the country by its inhabitants. About half of all the places are in the northeastern corner of the region; about half toward the southwestern corner and one or two in the northwestern corner toward the middle.

The Aluggud oil (now dried to asphalt) seems to to have come from rocks of carboniferous age, to judge by their fossils, though other things would rather show that they were of later age. If they are carboniferous, then the nummulitic rocks are wanting above them, and have thinned completely away from a thickness of 2,000 feet only 30 miles distant. This oil is also the only case of oil outside of the older tertiary rocks anywhere in the whole region.

All the other oil springs or shows of oil in the southern part of the region are on the northern side of the Salt Range and in the nummulitic lime rock, or close above it. The northern ones are either in the nummulitic lime rock of the Choor hills, the same probably as that of the Salt range, or in the Gunda rocks (chiefly sand rocks) that lie south of them, also accompanied by nummulites.

In every case the oil seems to come from a deposit of very small horizontal extent, sometimes only a few feet, seldom as much as a few hundred yards; only in one case, that of the Chhota Kuta and Burra Kutta oil springs near Jaba, does the deposit seem to extend as much as half a mile. Here, too, the oil comes from a thickness of about 100 feet, and the natural springs yeild as much as three quarts a day. At all other places the oil comes from a much smaller thickness of rock, from 40 feet at Aluggud and 20 at Gunda and Punnoba downward. Scarcely do any two oil springs come from the same bed of rock.

The oil is dark green in color and so heavy as to mark 25 degrees of Beaume's scale, or even less. The Gunda oil has been burned a little by the natives with a simple wick, resting on the side of an open dish; but the Punnoba oil is more inflammable and needs a special tube for the wick, though the main opening of the dish or lamp may stay uncovered. The oil, generally, however, has been little used for burning, except at Punnoba, but has been sought for as a cure for the sore backs of camels. The asphalt was highly prized 40 years ago by the natives as a medicine, especially for broken bones. It was carried far and wide, and was called "negro's fat," because it was believed to have dripped from the brain of a negro who had been hung up by the heels before a slow fire.

It is perhaps needless to say that there is nothing whatever in the mode of occurrence of the Punjab oil to uphold the chimerical belief that rock oil passes by distillation, emanation or otherwise from one set of rocks to another that it originates in any different

rocks from those in which it is found; and nothing to show that it has been formed by any other method than the very natural and sufficient one of the slow decomposition of organic matter, deposited along with the other materials of the rock. Neither is there anything to show that the oil has been driven up by the upward pressure of water from the lower parts of a bed of rock through its pores to a higher part of the same bed; on the contrary, as the rocks near most of the oil springs dip pretty steeply, if such an action of water were possible, all the oil would long ago have been altogether forced out of the rock at the outcrop. Indeed, such an idea is quite inconsistent with the fact that even a slight amount of oiliness in the pores of the body is a complete bar to the entrance of water; much less could water (without soap) scour the oil from one mass of rock and make it flow into another mass filled with moisture. If oil wells are more numerous in some regions along the tops of rock saddles, the reason is clear, that the oil bearing bed lies too deep for drilling conveniently elsewhere. Wild hopes have sometimes been entertained that a large amount of oil might by drilling near the oil springs, be struck in some cavity below the oil bearing bed; but it is safe to say that they are not justified by anything whatever, either in the Punjab or in any other part of the world either in the practical experience of oil drilling or in the general laws of physics.

CHINA.

Late accounts from China report immense oil fields, some of which are worked to a limited extent. The Chinese may justly claim to be the first to drill for oil, as for hundreds of years they have regularly drilled their wells, and that to a very great depth. The celebrated traveler, Abbe Hue, discovered the existence of petroleum in many parts of the empire. In describing the wells he states that many are drilled to a depth of 1,500 to 2,000 feet, the drilling being done very laboriously by a tube six inches in diameter.

A Catholic missionary who was engaged in the province of Slo-Tchouch in 1833—a territory which is celebrated for its fine wells, gives some very interesting particulars about the petroleum business in the Celestial empire. After describing a burning well and the method of quenching it by turning the waters of a small lake upon the flames, the missionary states that when the mouths of these wells are closed the gas is conveyed to any place where it is needed through hollowed bamboos and used for lighting the towns and villages. He also describes how in a province about 200 leagues from Canton the gas is used in the great salt mines for fuel. The gas is conducted under the boilers by bamboos from the well. These are tipped with earthenware, which keeps the bamboo from burning when the gas is ignited. So great is the quantity of gas produced that all the flame cannot be utilized, but much of it is allowed to escape to the surface of the earth by means of chimneys.

JAPAN.

A very extensive and valuable oil field exists in this country. Oil is found at shallow depths by sinking pits. An English company recently purchased the necessary tools and machinery to commence developments. This company took out with them a driller and refiner from the Pennsylvania oil regions. From accounts received from this field, we conclude that it is of a very promising character.

ALSACE.

The value of Alsace to Germany, and the consequent extent of the loss to France, commercially considered, are alike enhanced by the probable development of a considerable petroleum industry in that celebrated province.

Oil works on a small scale already exist in the valley of the Rhine, near the village of Schwatwiller, within and near the borders of the forest of Hagenau. A thick alluvial deposit has first to be penetrated, beneath which are alternating strata of indurated clay and micaceous sandstone, with seams of compacted sand. These last named seams contain the petroleum and are found at a depth of 200 or 250 feet. Indications of the presence of petroleum are observable in various parts of the forest and bitumen is found and worked in the adjacent country. Drillings to test the presence of the petroliferous sand have been multiplied to some extent, and in all cases with satisfactory results. The mode of working very much resembles that of a colliery. We believe that at present there are only two oil pits existing, and one of these is of a very recent date. The pits are sunk in the ordinary way, and the seams of sand are worked by galleries, in a manner similar to that of getting coal. As the workmen cut their way through the compacted sand the oil oozes out of it, running down the wall of the gallery to the floor, where it accumulates in shallow wells dug for the purpose. From these wells the crude petroleum is conveyed to the surface. But the process of draining does not remove all the oil, and the sand itself is accordingly taken to the surface, to be distilled in retorts. The crude oil which oozes from the sides of the gallery, and that which is distilled from the sand, are subsequently rectified by a further distillatory process, and the product is understood to be in no degree inferior to Pennsylvania refined petroleum. In working the existing pits it is a singular fact that no water is found. Of the extent to which the petroliferous sand prevails, it would be premature to judge at present, but there seems no reason to doubt its presence over a considerable range of territory.

HANOVER.

Experiments have been made in regard to the well ascertained deposits in different localities in Hanover and drilling has been prosecuted in the neighborhood

of Helde, with the object of determining the thickness and extent of a remarkable layer of chalk, occurring at the depth of about 120 feet and saturated with petroleum. Several years ago this chalk deposit was examined to a depth of 400 feet, and the first 150 feet were extremely rich in petroleum, and various amounts were yielded as the drillings descended. It would appear that in consequence of the inefficiency of the apparatus the engineer was unable to penetrate any deeper than 400 feet at the point pure petroleum was found. At present the drilling is to be conducted more vigirously and is to be carried down to a depth of 1,000 with a drill of the diameter of 17 inches.

ITALY.

From time immemorial the inhabitants of Rivanazzano, a small place a short distance from the town of Voghera in the former kingdom of Sardinia, have been in the habit of using mechanically a certain fluid which issues in small rills from the Madonna del Monte, as well as of burning it as a light in their dwellings. At the top of this mountain are the traces of an extinct volcano, and some short time since wells were sunk at its foot and their contents subjected to chemical analysis, the result of which was that petroleum of an excellent quality was found to be present in considerable quantities. The explorers then came to the conclusion that abundant subterranean reservoirs of this mineral oil must necessarily exist at no great distance from the scene of their operations and they determined to trace the above mentioned rills to their sources.

Excavations were accordingly commenced on the borders of the pleasant slopes of Nazzano, some 12 kilimoters from Voghera. At a depth of about 15 meters a considerable issue of gas took place and when 30 meters had been reached salt water strongly impregnated with petroleum was met with, a circumstance which the explorers remembered as always occurring in the oil springs of Pennsylvania. Following up the excavations, loud explosions of gas took place at a depth of 90 meters, and large volumes of salt water mixed with petroleum issued from a stratum of sandstone rock which was there met with. Pumps, on the principle of those used in America, under similar circumstances, were then introduced and an abundant supply of petroleum obtained. Ultimately a concession of this valuable property was granted by the Italian government to the explorers, as a reward for their exertions.

The petroleum thus obtained has now been refined and found to yield a valuable lubricating oil, and one well adapted for mixing up paints and varnishes, while the oil for burning gives a very brilliant white light, and has been found remarkably free from the offensive odors usually existing in mineral oils. Our contemporary adds that the result of these explorations has created quite a sensation, and that it is to be hoped that capital will not be wanting to fully develop discoveries which have been pronounced by eminent engineers, geologists and chemists to be most promising in a commercial, as well as important in a national point of view.

"At Salso the Marchese della Rosa," says an American gentleman traveling in Italy, "took me to see the place where he is drilling for oil. The country has very much the appearance of that around Oil City, Pennsylvania. The Marchese said that one could not stick a cane into the ground without finding traces of oil. The work has now been carried down about 1,000 feet, but not in paying quantities.

NEW ZEALAND.

In the vicinity of Taranaki there is an exhalation of gas, and bubbles of bituminous matter have been observed since the earliest days of the settlement, at about a half mile from high water mark, between the mainland and Moturoa, the highest of the Sugar Loaf islands; and according to Dieffenbach, "was whimsically attributed by the Maoris to the decomposition of an atua, or spirit, who was drowned there."

It was not, however, until November, 1869, that any attempt appears to have been made to search for this oil by boring or sinking wells on land, and as these experiments have to a certain degree proved successful, much attention has been recently attracted to this natural production.

Two companies were formed to test the oil lands of this island. The Taranaki Company drilled two wells, and the Alpha Oil Company one well. Dr. James Hector, in his abstract report on the progress of the geological survey of New Zealand, says, close to the main Sugar Loaf and to the foot of the cliffs is the Taranaki Company's bore No. 1, which has been sunk with much trouble to a depth of 300 feet. The derrick stands at 10 feet above high water, and for some time the water level in the bore maintained by this level, but after a time it sunk suddenly to 32 feet, which would appear to indicate the existence of subterranean channels, communicating with chambers where there is less than the external atmospheric pressure, owing perhaps to the condensation of oil vapors. At 254 feet a patch of gray, ferruginous tufa was passed through, charged with oil, which was the only result. In this bore some patches of hard basaltic rock were encountered, but in the whole there was no decided change in the character of the agglomerate.

Taranaki Company's bore No. 2 is on the island on the north headland and is commenced on a shelf above the water level. The bore was in October sunk to a depth of 145 feet, being 10 feet in the sandstone, 95 feet in the agglomerate breccia, 30 feet in the consolidated tufa and a few feet more in the agglomerate again. A few oil patches have been passed through, but no appreciable quantity has been found.

The third bore is that of the Alpha Company, which is situated a short distance from the north well.

At 10 feet above high water, and close to the boulder covered shore, into a high sandy cliff, a shaft was sunk for 60 feet into the agglomerate, from the sides of which, at 44 feet from the surface, oil was found

to ooze. The shaft was continued by a bore hole to a depth of 180 feet, oil being got at 80 feet and again at the extreme depth. When allowed to stand at rest a considerable quantity of oil collected on the surface of the water in the well * * * accompanied by the escape of gas. The oil was pumped into a tub along with the water. Recently the well has been pumped more regularly and yields, I am informed by the directors, about two barrels per week."

The general results of the chemical examination of the oil obtained from these wells are given as follows: One hundred parts of crude oil, as obtained from the wells, having a specific gravity of .963, give—

Distilled oil of specific gravity.....	.874	.02
Distilled oil of specific gravity.....	.893	.10
Distilled oil of specific gravity.....	.917	.08
Distilled oil of specific gravity.....	.941	.60
Solid bitumen.....		.06.1
Fixed carbon.....		.12.4
Ash		.01.5
		100.00

The presence of petroleum has been reported in other parts of New Zealand. We understand that recent developments promise success. During the summer of the present year a complete set of the most approved Pennsylvania drilling tools were sent out to be used at this oil field.

NOVA SCOTIA.

Attention has been attracted to the existence of surface oil oozing from the sand rock exposed on the shore of Lake Anslie. A company has been formed at Halifax and are now operating under the superintendence of Mr. William Harrington. Two wells have been drilled to a depth of 800 feet, in which the tools were lost. A third was commenced of which we have had no report. The drill has revealed the existence of three sand rocks. The second well struck oil at 758 feet. Oil was produced from this well in such abundance as to give reasonable evidence of the existence of oil in paying quantities. The oil taken from the well was of unusually high gravity and almost destitute of odor. The oil field is distant from Halifax some 200 miles and is near a fine harbor on the coast, which we understand is now connected by rail with Halifax.

RUSSIA OIL FIELDS.

CAUCASIAN OIL REGION, 1871.

The petroleum deposits of the region of the Caucasus are very remarkable. For many centuries the springs have been known and the oil has been collected by skimming. On the eastern shores of the Caspian sea 20,000 such wells, all of them quite shallow, existed in 1868. The wells are described as being often close to each other, and the opening of a new one, it is ascertained, does not affect the productiveness of another near it. One sunk in 1863, by the side of another, which for centuries had produced 3,500 pounds per day, yielded 40,000 per day, without affecting in the least the first. The American method has lately been introduced, and flowing wells have burst forth from a depth of 250 feet, which have, until controlled, sent up a jet from 40 to 60 feet high. It is calculated that 19,000,000 pounds are annually produced in the Caucasus region. The present oil producing region is 25 miles in length and about half a mile in width. The oil is found in a porous argillaceous sandstone belonging to the tertiary period. In the vicinity are hills of volcanic rocks, through which heavier sorts of petroleum flow out. It has been observed that from the central portion of the tract the oil is as pure as if refined, and by its faint yellow tint resembles Sauterine wine. That obtained near the sides of the tract is darker, changing to a yellowish green, then reddish brown, and finally to asphaltum.

The oil is largely introduced into Persia, and over large districts no other material is used for producing artificial light. The following article by M. Sainte-Claire-Deville upon the properties of Caucasian petroleums will be found of much interest:

On the Physical Properties and the Calorific Power of Some Petroleums of the Russian Empire. By M. Sainte-Claire-Deville, Corresponding Member of the Academy of Sciences of St. Petersburg. Read April 21, 1871.

Rear Admiral Likhatchof desiring to know, in the interest of the transport trade on the Caspian sea, the value and composition of the petroleum oils of Bakou, sent to me samples of these materials. I have made a very attentive examination of them, persuaded that one day the employment of mineral oils as a combustible will be general in all countries where nature furnishes them abundantly to a regular and well organized exploitation.

Petroleums receive divers applications which necessitate a knowledge of certain of their properties and composition. These special properties and the result of their analysis will be the object of this memoir.

1. The investigation of volatility.—Petroleums are employed in considerable quantities for lighting purposes. Lamp oils, to use an expression established in France (les huiles lampantes), ought at the same time be very fluid in order to mount easily into the wick, and little volatile in order not to be too dangerous in their management. The more fluid these oils are, the more volatile are they, and the lower their density. When they distil, as they do in Amreica, on a large scale, petroleum of low density, they only devote to the manufacture of lamp oils the intermediate products whose points of ebullition are above 150 degrees and below 250 or 280 degrees. Those portions which go above 300 degrees in the retorting possess a viscosity which make them useless for lamps, and puts them in demand for the fabrication of lubricating matters, or for fuel. To handle a petroleum oil, one must know exactly the number which represents the quantity of these volatile matters between 150 and

300 degrees. This number indicates the proportion of lamp oils which can be exrtacted from the natural product.

All that which does not pass in the distillation below 280 degrees should be considered as properly furnishing the lubricating oils, or to be employed without danger as a combustile of perfect quality. As to the volatile portions below 150 degrees, they are composed of gaseous substances, such as hydrure of butyline, or of matters possessing at ordinary temperatures strong volatility. These are the substance which cause such frequent accidents since the development of a commerce in petroleums on so grand a scale.

The table which I am about to give, and which contains numerous figures relative to the volatility of the Caucasian oils, enables them to distinguish at once those which are dangerous, those which furnish lamp oils, and finally the parts of these oils which may be employed for heating purposes.

It will suffice for this to state for each of them the quantities of materials volatilized below 150 degrees, between 150 and 300 degrees, and those which have resisted this temperature.

M. Likhatchof has sent me three specimens of oils, or products of the works at Bakou. On submitting them to distillation, the following results are obtained:

No. 1. Raw Naphtha, from the Balchany Wells.

Volatile matters at 100 degrees.....	1.0 per cent
Volatile matters at 160 degrees.....	5.0 per cent
Volatile matters at 180 degrees.....	9.3 per cent
Volatile matters at 200 degrees.....	14.0 per cent
Volitile matters at 220 degrees.....	15.3 per cent
Volatile matters at 260 degrees.....	29.0 per cent
Volatile matters at 280 degrees.....	37.0 per cent
Volatile matters at 300 degrees.....	41.3 per cent

No. 2. Residue from distillation of the Bakou Wells.

Volatile matters at 240 degrees.....	1.0 per cent
Volatile matters at 260 degrees.....	2.3 per cent
Volatile matters at 280 degrees.....	4.3 per cent
Volatile matters at 300 degrees.....	7.7 per cent

No. 3. Black oil from the Weyser works, Bakou.

Volatile matters at 200 degrees.....	2.3 per cent
Volatile matters at 240 degrees.....	8.0 per cent
Volatile matters at 260 degrees.....	14.0 per cent
Volatile matters at 280 degrees.....	22.3 per cent
Volatile matters at 300 degrees.....	33.7 per cent

Numbers 1 and 3 give a certain quantity of lamp oil, and No. 2 can only serve as a combustible or lubricating substance.

The specimens from another source, but which have been collected at Bakou itself, and of which M. Likhatchof has sent me great quantities, have given the following results:

No. 4. Light Oil.

Volatile parts at 140 degrees.....	2.7 per cent
Volatile parts at 160 degrees.....	7.0 per cent
Volatile parts at 180 degrees.....	13.3 per cent
Volatile parts at 220 degrees.....	19.0 per cent
Volatile parts at 240 degrees.....	23.3 per cent
Volatile parts at 260 degrees.....	29.3 per cent
Volatile parts at 280 degrees.....	36.7 per cent
Volatile parts at 300 degrees.....	75.3 per cent

No. 5. Viscous Oil.

Volatile parts at 200 degrees.....	1.0 per cent
Volatile parts at 220 degrees.....	1.3 per cent
Volatile parts at 240 degrees.....	3.7 per cent
Volatile parts at 260 degrees.....	1.0 per cent
Volatile parts at 280 degrees.....	6.0 per cent
Volatile parts at 300 degrees.....	9.7 per cent

These materials are those which have served to determine the calorific power which will be given further on.

2. Density and coefficients of dilatation. —I have had many times occasion to note the dangers which arise during the transportation of petroleums from their considerable dilatilability. When a building is filled with barrels containing petroleum, a large empty space must be left in order to avoid their explosion; the volume of which space can be calculated from tables now to be cited, constructed with reference to the changes of temperature to which the material may be exposed on its voyage or during its stay in the ports and warehouses of commerce.

I have taken the density at 0 and 50 degrees of the petroleum oils of Bakou, and have calculated with these numbers their coefficients of dilation. Supposing the oil to be exposed during its voyage to a change of temperature of 50 degrees, which is prudent to admit, the value of the space which must be left empty in the vessel is found by means of the following formula: $v+k+50$; v being the volume of the vessell and k being coefficient of dilatation given below:

No. 1. Density at 0°.....	0.882
at 50°.....	0.8473
Raw naphtha from the Balchany wells.	
Coefficient of distillation.....	0.000781
No. 2. Density at 0°.....	0.928
at 50°.....	0.888
Residue of distillation from Bakou works.	
Coefficient of distillation.....	0.00091
No. 3. Density at 0°.....	0.897
at 50°.....	7.865
Black oil from Weyser works of Bakou.	
Coefficient of distillation.....	0.000737
No. 4. Density at 0°.....	0.884
at 50.....	0.854
Light oil of Bakou.	
Coefficient of distillation.....	0.000724
No. 5. Density at 0°.....	0.938
at 50°.....	0.907
Heavy oil of Bakou.	
Coefficient of distillation.....	0.000681

3. Elementary composition.—The elementary analysis of petroleum serves principally to calculate the theoretincal calorific power of these minerals. In default of direct determination, you can admit that the quantity of heat given by the combustion of the compound is the sum of the quantities of heat of the combustion of the elements, and calculate thus the calorific power of these hydro-carbons. The number thus found for petroleums is always a maximum that experience never permits us to reach, doubtless because carbon and hydrogen in combining disengage heat and naturally this disengaged heat is no longer present in the compound. But, as M. Macquorn Rankine has very judiciously remarked, you obtain by this calculation an approximate number, which, wholly inexact as it is, may be a guide in the comparison of values, as combustible of divers mineral oils. Here are the results which I have obtained by analyzing the petroleums of Bakou. I designate them by the numbers which have already served me to specify them in the preceding chapters.

No. 1.	Hydrogen	12.5
	Carbon	87.4
	Oxygen	0.1
		100.
No. 2.	Hydrogen	11.7
	Carbon	87.1
	Oxygen	1.2
		100.
No. 3.	Hydrogen	12.0
	Carbon	86.5
	Oxygen	1.5
		100.
No. 4.	Hydrogen	13.6
	Carbon	86.3
	Oxygen	0.1
		100.
No. 5.	Hydrogen	12.3
	Carbon	86.6
	Oxygen	1.1
		100.

To compute with these results the heat of combustion, deduct from the number of hydrogen one-eighth of the found, multiply this difference by 344.62, multiply the number of the carbon by 80.8, and get the sum of the two products thus obtained.

Thus calculated, the following table gives the theoretical heat of combustion of the Bakou oils:

No. 1	11.370 units of caloric
No. 2	11.000 units of caloric
No. 3	11.060 units of caloric
No. 4	11.660 units of caloric
No. 5	11.200 units of caloric

4. Calorific power or heat of combustion.—I have determined already the calorific power of petroleums by proceedings which have been described in reports rendered by the Academy of Sciences. No longer having at my disposal the apparatus which has served for these experiments, I have had recourse to a method which seems to me to give also very good results, and which has the advantage of possible application whenever you have a steam engine whose boiler is heated by mineral oils.

I have shown that the heavy oil of gas works has a very nearly constant composition, and furnishes with truly remarkable regularity the same quantity of heat when it is burned in a calorimeter rightly arranged. Under these conditions heavy oil at 0 degree, a density of 1.044, furnishes by kilogram 12k.77 of vapor, and produces in burning 9.916 units of caloric. These numbers being definitely fixed (see table reports), it is evident that a sufficiently exact relation could be obtained by burning successively representative oil under the boiler of a steam engine producing a known work, and then the oil to be experimented on doing the same work, and burning the same quantity of matter. The quantities of water vaporized by the combustibles will be very nearly in proportion to their calorific powers. As you know the number for the heavy oil, a simple proportion enables you to determine the heat of the combustion of the mineral oil taken experimentally.

I operated upon an engine with a Belleville boiler of eight horse power. I maintained constant, for less than a tenth of an atmasphere nearly, the pressure in the boiler while the engine was condensing in a large iron reservoir of 40 cubic meters, air at a constant pressure of two atmospheres three-quarters.

The air brought in by pumps escaped by a cock whose opening was conveniently arranged so that—the engine doing a constant work—the pressure in the reservoir remained itself absolutely invariable. Under the conditions which I have just mentioned, you can measure exactly the quantity of water volatilized in the boiler, the quantities of oil consumed to produce the constant work of the engine, and when you have made the two determinations successively for the heavy gas, oil serving as representative and the oil taken as experiment, you have given all that is necessary to calculate the calorific power of this last.

1. Baku oil, specimen sent by M. Likhatchof, and arrived in a sheet iron box carefully closed, fluid oil and already studied under No. 4.

Here are the results of its comparison with heavy oil:

Heavy oil has given—	
Pressure of the engine	3a.8
Pressure of the air in the reservoir	2a.75
Temperature of the feed water	26°.
Volatilized water	161k.
Oil consumed	18k.23
Oil No. 4 has given—	
Pressure of steam	3a.8
Pressure of the air in the reservoir	2a.75
Temperature of the feed water	26°.
Volatilized water	175k.
Weight of the oil burned	15k.45

From this is deduced:

1. Calorific power of oil No. 4, 11,460 cal. Quantity of vapor produced at an ordinary pressure, and without work, by one kilogram of oil, 16k.4.

2. Bakou oil, specimen sent by M. Likhatchof, and arrived in a sheet iron box, carefully closed, oil very viscous, and already examined above under No. 5.

This oil, to flow easily in the pipes of conduit, requires that it should be put under a pressure of about four decimeters of mercury. To burn well an oil so little volatile, you must give to the vertical grating of my preparations (see their descriptions in the reports) a little more height than for the fluid oils, and so dispose it (or such a disposition) that the air arrive a little more easily at the bottom than at the top of the grate, where the access of the air should be a little narrower.

Oil No. 5 has given:

Vaporized water	126k,6
Oil consumed	11k.852

From this is deduced:

Calorific power of oil No. 5	10.800 cal.
Quantity of vapor produced without work and at ordinary pressure by one kilogram of oil	15k.55

If you compare these calorific powers with those which were theoretically deduced from their composition, you find:

	Observed power.	Calculated power.	Diff.
Oil No. 4	11,460 cal.	11,660 cal.	200
Oil No. 5	10,800 cal.	11,200 cal.	400

If you admit that this difference which is in mean some 300 units of heat, between the real calorific power and the calculated calorofic power, is the same for all the Bakou oils, you find for the specimens of the materials sent me by M. Likhatchof, which bears the numbers 1, 2, 3, and of which too small a quantity were sent me to make the experiment possible, the following results:

	Real power.	Calculated power.
No. 1	11,070 cal.	11,370 cal.
No. 2	10,700 cal.	11,000 cal.
No. 3	10,760 cal.	11,060 cal.

All these determinations are infected by a very slight cause of error, proceeding from the manner in which the calculations are established. But they demonstrate nevertheless that the oils of Bakou, compared to the American and European oils which I have examined previously, hold the first rank from the considerable value of their calorific power.

HISTORY OF THE RUSSIAN OIL FIELDS.

Bakou, Balakhani, Grosnia, Romanee and Sabroonchi.

Bakou, the chief oil town of Russia, is a city of 140,000 people and was originally a walled city, and it contains some interesting old towers and buildings. For more than a hundred years it has been a Russian possession, being in its early occupation by Russia a penal colony at the time the walls were built. Now the place is an oil town, having outgrown the limits of the great stone wall that surrounded the original ancient settlement, althought the wall, some 30 feet high, still stands in excellent condition. The city inside the walls is largely peopled by Persians and Armenians, who manufacture every variety of thing and keep stores. Baku is on the Caspian sea, but a few miles from the Persian frontier. It is the extreme southeastern point of Russia, about 575 miles from the Black Sea, and 1,200 miles from Constantinople, Turkey. From the Black Sea Baku is separated by the Caucasus mountain range, a high and rocky continuation of the Alpine system that runs all through Southern Europe, from France to the Caspian Sea. The Caucasus reach a height of from 3,000 to 3,500 feet, the lowest summit crossed by the Trans-Causasus railroad at Pomi, being nearly 3,000 feet above sea level. After the Caucasus are crossed, going from the Black Sea eastward, the descent is rapid to the arid plains of Georgia. From Tiflis, a thriving and populous Georgian city, to the Caspian Sea, a distance of some 300 miles, is a gravelly plain, occasionally broken by a mountain spur, fertile when irrigated, but with little rain.

The surface is a drift formation—sand, gravel and cobblestone boulders—indicating that at one time the Caspian Sea extended from its present limits to the foot of the Caucasus mountains. Baku and the Baku oil fields are undoubtedly in what was the bed of the sea. Naturally the American expects to find in such a place a stratified formation of aqueous rock, like our regular deposits of oil sands and limestone formations, but he finds nothing of the kind. The Caspian country is simply a great loose deposit of sand, gravel and boulders, swept down evidently from the mountains, carrying at times a little clay, which must not be forgotten in studying the singular oil country, all thrown together, which forms the sources of the oil. The sand carries a little clay, which makes it impervious to water to a great extent, but the clay is not sufficient to bind the mass together. The depth of this formation is not known. It continues to the bottom of the deepest oil well, some 2,000 feet, and in this more or less loose sand and gravel all the oil of Baku is found. Baku is nearly 100 feet below the sea level. The Caspian is a salt sea with no outlet; it is slowly lowering its level. Its coast skirts the city of Baku, situated on a slight rise above it. The oil wells are drilled to a depth of from 300 to 2,000 feet below the surface and were it not for the clay in the loose sand the sea would percolate into every well drilled, for some of them are but a few feet distant from the beach. Yet, while the clay in the sand does hold the water back, it does not stiffen the sand so that it will stand up or permit drilling, and every hole drilled has to be cased, as the hole is drilled, or the wall will fall in. While Baku is the center of the oil fields, there are no wells in the city. On the contrary, they are situated in five places. South of Baku about two

miles is Bibi-Eibat, a field about a half a mile square, which at one time produced more oil than all the wells in America. Eight miles south of Baku is Balakhami, the largest oil field of Russia, two miles long and one mile wide. Close by, and really an extension, is Sabroonchi, and farther east is the smaller oil field known as Romanee. The four fields do not cover a scope of more than four square miles. The Romanee oil field is famous for containing the big oil well of Asaddulaeff, which flowed at one time 150,000 barrels of oil a day. That was more oil than all the wells of America combined were producing at that time.

When one of these big wells is discharging its flow of oil in the air before it is in some measure confined, the sight is wonderful. The column of oil and sand shoots up to 400 to 500 feet, and if the wind is blowing the spray is carried miles away.

The wind over the plain from the Caspian had a fashion of blowing a gale very often, and it not infrequently happens that while a big well is flowing in the air a gale sweeps in off the sea, and then havoc be paid for frequently by the man who is the owner of a big well to find himself in receipt of heavy bills for damage; and gardens, houses, churches and buildings of various sorts destroyed by the oil have had to be paid for frequently by the man who is the owner of one of these phenomneal fountains of oil. Sand, gravel and gas. Were it not for one thing drilling an oil well in the Apsheron peninsula would be the easiest drilling imaginable, for in the soft sand the drilling tools will drill faster than the sand and gravel can be bailed out. A well could be drilled with a shovel, but as it is, drilling a Russian well is a task that takes five or six months, and costs anywhere from $8,000 to $25,500. Our American drillers would look at the Russian outfit and laugh, and think to improve on it, and do good work, but an American driller in Russia, to succeed, has to learn the Russian method and follow it. Years of experience and trials of all plans have shown what is best. The Russian derrick is built of immense spars, set upright instead of the fragile plank fabric that an American erects. The spars are stoutly braced with smaller timbers, and all the derrick is boarded in for a two fold purpose; first, to protect the workmen, and second to keep the well from flowing in the open air, as the wind has the habit of carrying the oil and scattering it over houses and gardens, etc. When the derrick is completed and rigged up a joint of casing from 28 to 30 inches in diameter, made of heavy boiler iron and riveted, is set in place to start the conductor hole. It is driven, pile driver fashion, with a heavy wood maul, into the sand as far as it will go; the tools are then used to clean out the hole to the bottom of the casing. Practically the whole procss of drilling a well is to clean out the sand at the bottom of this big casing. So that it can be forced or driven downward into the earth. As one joint of casing a few feet long is lowered, another is riveted to the top, instead of screwing it together, as in America, and the process of drilling and lowering the sectionel casing is continued. The soft sand presses against the casing, and after a short distance the pressure is so great that further headway is impossible. Then a smaller size of casing is introduced, and work goes on again at the bottom of the hole. The theory of procedure is similar to the system of casing through the cave in this state of West Virginia, except that in Russia the casing must keep up with the tools to attempt to drill a few feet and put the casing in the hole would be as absurd as to try to drill a hole in the Atlantic ocean.

Innumerable accidents happen. The casing sometimes collapses from the pressure of the sand, or perhaps a boulder is encountered that stands in the way of progress, and it makes a crooked hole, or the casing batters at the bottom, or the sand that comes up cuts the casing into shreds, or the casing sticks fast, and will not drive lower, or the tools are lost, and fishing in the sand becomes necessary. As a consequence the number of wells drilled is not large and not over 25,000 have been drilled in Russia since oil was first drilled for. A Russian well is never finished. A well that has produced an enormous quantity of oil may cease to produce and be drilled deeper and produce more oil than before. The oil wells in Russia are mostly owned by the Nobel family. The Nobels are of Swedish descent.

Emmanuel Nobel, the father, was the inventor of the torpedo, and one of his sons, Alfred Nobel, discovered dynamite, and Robert and Ludwig Nobel became the twin organizers of the Russian petroleum industry . In 1875 the brothers began to refine oil at Baku. Later a refininery was built near the wells at Balakhani. The first pipe was laid by the Nobel brothers in 1876 from Balakhani to the Black town, or Baku, a distance of eight miles, through the Aspheron oil region, owing to the great cost and leakage of the barrels.

The first liquid transport or "cistern steamer," appared on the Caspian in 1879. The first was named the Mahomet, second Tatarin, third Bramah, fourth Spinoza, fifth Darwin, sixth Talmud, seventh Koran, eighth Calmuck, ninth Zoroaster. The vessels are steel, built 245 feet long, 27¾ feet broad and when laden with kerosene have a draught of 11 feet. The engines are of 120 nominal horse power, steaming at 10 knots; they burn oil for fuel. The bunkers contain a supply calculated to last six days, sufficient for the journey from Baku to the mouth of the Volga. The oil is transferred in smaller boats. The large vessels cost $28,000, and the smaller ones $15,000. The smaller boats take the oil from the mouth of the Volgoa to Tsaritzina, and pump it into reservoirs for storage, alongside the railway, from which point it is sent over the Russian railway to middle and western Europe. In 1877 tank cars were introduced by the Nobel brothers and in two years they had 1,500 of them in use. In 1879 the business became a joint stock company, under the title of Nobel Brothers Petroleum Production Company (Tovarishchestro Nephtanavo Proisvoodstva Bratieff Nobel). The chairman being Ludwig Nobel, the oil king of Russia, and the directors General Bilderling, Alfred Nobel, Count Tatischeff and Mr. Beliamins.

Tsaritzin was made the starting point of the railroad. In the winter the Volga is frozen over and no oil could be carried for four months from Baku to Taritzen. In summer, on the other hand, when the boats can run freely, twilight prevails all night long,

and the public need no kerosene As a result of this it was necessary to form in different parts of Russia great storage depots where the oil could be collected in summer, and from whence it could be distributed in winter. The central place chosen for this operation was Orel, which is conveniently situated in middle Russia.

Stations are located at St. Petersburg, Moscow, Warsaw and Saratoff and at points on the Baltic and Black Sea. The company delivers all the oil in tank steamers, tank cars or in iron tanks. No barreling is carried on by the firm. They sell the oil by ship load or train load to the oil dealers in provincial Russia. No oil is sold only for cash. Owing to the high tariff by Russia on foreign oil American oil is excluded from Russia.

HISTORY OF THE OIL INDUSTRY OF ECHIGO, JAPAN.

In 1613 a man called Magara Mikei discovered oil at Karameki, near Nutsu, where the fire well is located. The first refinery was built in 1869 at Naguaka by Nakajima Sangoro and Wakizaka Hachigoro. Oil is produced in the following places: Shiwodani, Nagasaga, Urase, Urase and Hire, Amaza, Miyagawa. Names of oil companies: The Amaze Sekiyu, The Nippon Sekiyu, The Nippon Sekiyu Kwaiska, The Zawo Sekiyu.

CHRONOLOGY OF THE OIL FIELDS OF AMERICA.

The first oil well drilled in America expressly for oil was the Bissell-Drake well at the junction of Pine and Oil creeks, Venango county, Pa. The well was drilled into the first sand Saturday, August 27, 1859. Production first 24 hours is estimated at 20 barrels.

EARLY OIL HISTORY OF TIDIOUTE, PA.

Early in 1860 the Tidioute oil field was opened and so numerous, eager and energetic were the operators that in July of that year more than 60 wells were being drilled at the same time. A perfect furor raged for a while. Squater claimants took possession of sandbars in the river, while others of the same class essayed to drill for the greasy product from floats and rafts anchored in mid stream. A number of the rafts were cut loose and let float down the river. The floats or rafts were watched night and day. A regular war was going on between the owners of the leases on the island and shore land of the Allegheny river and the squatters. When the fight was at its height a rise in the river washed the rafts and floats down the river.

In 1861 Triumph and Enterprise oil fields were struck.

In 1862 Fagundus oil field was struck.

FIRST WELL DRILLED IN BRADFORD, PA.

Bradford Oil Company organized January 10, 1861. Capital stock $5,000, divided into 1,000 shares, at $5 per share. President, S. Holmes; secretary, E. P. Steers; treasurer, L. T. Harper. Directors: Geo. Sanford, G. D. Crooker, C. L. Alton, J. R. Dart and H. Burgess.

The first hole was drilled 200 feet deep on the Kingsbury farm on West Branch, now in the city limits of Bradford. Pole tools were used. The contractors were Peter Chase & Co.

First oil discovered in Bradford, Pa., oil field was near the village of Limestone, Cattaraugus county, New York, in 1863. The first well in the Tuna valley was drilled by the Olmstead Oil Company on the Crookes farm in Pennsylvania about one-half mile south of the state line. A small show of oil was found at a depth of 550 feet.

In 1864 Dr. James Nichols, Henry Renner and Daniel Smith drilled a well just north of Limestone village to the depth of 570 feet and found a show of oil. The Hall Farm Petroleum Company, incorporated under the laws of New York, in 1865, purchased the Hall farm in Limestone village, Cattaraugus county, N. Y., and at once began drilling. After much delay the well reached the depth of 1,000 feet, when the company failed and turned the well over to Job Moses, the largest creditor. The well was drilled 50 feet deeper and at a depth of 1,050 feet sand was struck. On October 15th the well began to produce five barrels of oil and was a paying well until water broke in and flooded the sand and ruined the well.

In 1865 F. E. Dean and brothers drilled a well in the valley of Tuna creek on the Sheperd farm, near the present site of Custer City, Pa. One hundred and sixty feet of drove pipe was used. The well was drilled 900 feet deep and abandoned 200 feet above the Bradford sand.

In 1860 the citizens of the village of Bradford concluded to club together and drill the Barnsdall well deeper, and it was drilled to a total depth of 875 feet, or within 150 feet of the Bradford oil producing sand.

In 1867 F. E. Dean and brothers drilled a well on the Clark farm at Tarport, now East Bradford, to a depth of 605 feet, or over 400 feet above the Bradford sand. All of these wells were drilled with the expectation of finding the Venango county, Pa., oil sand at about the same depth below water level as at Oil City, but they were all dry holes at that depth. The first well drilled to the Bradford sand was drilled by James E. Butts, Hon. C. H. Foster, Darius Foster, Job Moses and others on the H. Gilbert farm, two miles northeast of Bradford, Pa.

Slush oil was found at a depth of 751 feet and in November, 1871, the well was drilled to the brown or chocolate sand, which was reached at a depth of 1,110 feet. The well began producing 10 barrels a day from this sand, which was then named the Bradford

sand. On December 6, 1874, Messrs. Butts and Foster drilled a well in the Bradford sand on the Archy Buchanan farm, two and a half miles northeast of Bradford. This well started off with a production of 70 barrels a day, and was the real beginning of the oil excitement in Bradford and McKean county, Pa.

The David Beatty well at East Warren, Pa., was drilled into the Glade oil sand in March, 1875 and produced 10 barrels of oil a day when first drilled in.

The John Bell well opened up the north Warren, Pa., oil field in 1876.

The Bradford Oil Company was chartered June 6, 1876; Wesley Chambers, president; L, G. Peck, secretary; J. T. Jones, treasurer.

H. L. Westerman well on Holder's run, Armstrong county, Pa., was drilled in the sand November 15, 1877. The well produces a water white oil that stands a fire test of 110 degrees as it comes from the well. The well is known as the Hair oil well and produces one barrel of oil a day.

The Tolles well was the first well drilled in the Stoneham, Pa., oil field in 1878.

In December, 1878, four years after the completion of the Butts well, the average daily production of crude oil in the Bradford oil field was 23,700 barrels, and in 1880 the Bradford oil field produced 63,000 barrels of oil a day.

In June,, 1880, the first oil well was struck at Clarendon, Pa., known as the Eagan well.

The first wells were drilled that produced oil in Tiona and Sheffield, Pa., in 1880.

The famous wildcat mystery on lot 646, Cherry Grove, Pa., was drilled in the oil sand May 17, 1882.

Wardwell and Glade run, Warren county, Pa., oil fields were being drilled in 1883.

The great Thorn creek, Butler county, Pa., oil field was opened up by the Phillips school house lot well in June, 1884.

Samuel Gantz mill lot well at Washington, Pa., was the first well to find oil in the second sand, in May, 1884 and was named Gantz sand in honor of the owner of the lot. Production of well 15 barrels of oil the first 24 hours. Well drilled for the Citizens Oil and Gas Company.

James Gordon farm well, Washington, Pa., was the first well drilled to the third sand, named Gordon sand in honor of the owner of the farm. Well drilled in Gordon sand in August, 1885; started to flow at the rate of 150 barrels of oil a day. People's Light and Heat Company, owners.

Kinzua and Jo Jo oil fields in Warren and McKean counties, Pa., were opened up in 1885.

Ben C. Farout Paper Mill lot well, Lima, O., was drilled in the Trenton limestone in June, 1885. After shooting the well it began to produce 10 barrels of black oil a day. By the drilling of this well the great Lima, Ohio, oil field was discovered.

The first Trenton rock well struck in the state of Indiana was drilled by the Eaton Oil and Gas Company in August, 1885, at Eaton, Deleware county. The well was a small gas well and produced a small amount of oil.

John McMannis farm well; first oil well drilled in the Taylorstown ,Pa., oil field. Drilled in the Gordon sand July 6, 1886; production first 24 hours, 125 barrels of oil. West Virginia Gas Company, owners.

D. F. Hamilton farm well, Mannington, W. Va.; first well to find oil in the Big Injun sand in the Mannington oil field. The well was drilled in the Big Injun sand October 3, 1889. The well was plugged and held as a mystery for a number of days. Flaggy Meadow Oil Company, owners.

First oil shipped out of Marion county, W. Va., in two tank cars April 10, 1890. The cars were decorated with flags and flowers, with two large, long streamers announcing the first shipment of oil from the Mannington oil field by the Burt Oil Company to Parkersburg, W. Va., via Grafton. That was a sight seeing day for Fairmont. Over 500 people gathered at the depot at Fairmont and watched the two tank cars of oil pass on their journey to Parkersburg.

Edward McDonald farm well, McDonald, Pa.; first well drilled in the fifth sand in the McDonald oil field. Drilled to the fifth sand November, 1890. Well began spraying oil at the rate of 10 barrels of oil a day. Royal Gas Company, owners.

Joseph Mathews farm well, Noblestown, Pa.; drilled in fifth sand July 17, 1891; began flowing at the rate of 1,200 barrels of oil a day. Jennings, Guffey and Galey, owners.

First oil well drilled in Smithfield, W. Va., well No .1, Laura Smith farm, South Penn Oil Company, owners. Well drilled in September, 1894, produced 10 barrels of oil a day from Big Injun sand. Geo. L. McKain, contractor.

The Chipmonk oil field, near Salamanca, New York, was opened up by a well being struck in April, 1895, on the Mike Kelley farm, owned by Dr. J. P. Colegrove, of Salamanca, New York.

The first oil well drilled on the Cornplanter Indian reservation at South Vandalia, New York, was struck on the flat near the Allegheny river, in March, 1897, at 382 feet. The well began to flow oil at the rate of 1,000 barrels a day.

Jacob Cunningham farm well No. 1, Mannington, W. Va., was struck October 15, 1901. South Penn Oil Company, owners.

Showalter farm pool, Morris Run, Littleton, Pine Grove district, Wetzel county, W. Va. First well struck June, 1903.

Lemaster's farm pool, Pine Grove extension, Wetzel county, W. Va., first well struck June, 1903.

McCalmont Farm Oil Company, J. H. McCalmont farm, six miles southwest of McDonald, Pa.; first well to produce oil from the Squaw or Lewis sand. Production first 24 hours, eight barrels light amber oil.

Milton oil field, Cabell county, W. Va., first well struck September 1, 1903; oil dark, 39 specific gravity.

Church Forks oil field, near Hundred, Wetzel county, W. Va.; Mrs. Sarah Anderson farm; first well drilled in the fourth sand July 4, 1904; production first 24 hours, 300 barrels of oil. Philadelphia Gas Company, owners.

HISTORY OF OIL FIELDS.

The most notable fields in the Appalachian region beginning at the north or upper field are the Allegheny and Chipmonk, of New York; the middle field, Warren, Forest, Venango and Crawford counties, Pa.; the lower field, Butler, Clarion and Armstrong counties, Pa.; the southwest Pennsylvania fields, Allegheny, Beaver, Washington and Green counties, Pa.; the West Virginia oil fields, Mannington, Eureka, Sistersville, Volcano, Cairo, Wolf Summit, Salem, Smithfield, Folsom, Sand Fork, Ritchie and Calhoun counties; the Gould, Scio, Marietta, Macksburg, Corning and Monroe county fields in southeastern Ohio.

GEOGRAPHICAL RANGE OF THE SEVERAL DIVISIONS, WITH NAMES AND DATES OF PIONEER OIL WELLS.

Oil Creek, Pa., Division.—Oil Creek valley and borders, Cherry Run, Keech farm, West Pithole, Pleasantville and surroundings, Enterprise, Shamburg, Octave, Titusville and Church run. Commenced producing August 27, 1859, from Drake well, near Titusville, Pa.; well 69½ feet deep; produced about 20 barrels per day.

Central Allegheny, Pa., Division.—Allegheny river from Scrubgrass to East Hickory, including East Sandy, Bully Hill, Franklin, Reno, Slate run, Walnut Bend, Henry's Bend and mouth of West Hickory. Commenced producing oil in the fall of 1860; Evans well and others at Franklin.

Tidioute, Pa., Division.—Tidioute, Economy, Dennis run, Triumph, New London, Colorado and Fagundus. Commenced producing in the fall of 1860, Island well, at Tidioute; Economy well "A," or flowing well, struck December 25, 1860.

Beaver, Pa., Division.—Smith's Ferry, Ohioville and Slippery Rock. Commenced producing oil December, 1860, Patten, Finlen, Swan & Co.'s well; produced oil at 180 feet deep.

Pithole, Pa., Division.—Holmden, Morey, Ball and Rooker farms and the Cashup pool. Commenced producing oil January 7, 1865, United States Oil Company's Frazer well.

Butler and Armstrong, Pa., Division.—Embracing all the oil territory in these two counties. Commenced producing oil October, 1865, Tom's run well, near Parkers; January 3, 1866, Brady's Bend well, No. 1; March 23, 1878, Troutman well at Modoc.

Clarion, Pa., Division.—Foxburg, Richey run, Emlenton, St. Petersburg ,Edenburg and Shippensville. Commenced producing oil in 1866.

Bradford, Pa., Division.—The northern oil field of McKean county, Pa., and Cattaraugus county, N. Y. Commenced producing oil in the summer of 1868, Moses well No. 3, about five barrels; November, 1872, Foster Oil Company's well No. 1, about 10 barrels; December, 1874, Butt's well No. 1, about 70 barrels; summer of 1875, Olmstead well.

Warren and Forest, Pa., Division.—Warren, Stoneham, Clarendon, Cherry Grove and Sheffield, in Warren county; and Balltown, Blue Jay and Cooper districts in Forest county, Pa. Commenced producing oil in March, 1875, Beatty well No. 1, at East Warren; April, 1877, Grandin and Berry No. 1 at Balltown; summer of 1877, Huling's well, Blue Jay district; January 12, 1878, Tolles No. 1, Stoneham; June 24, 1880, Eagan No. 1, Clarendon; April, 1881, Magee and Horton No. 1, south of Sheffield; May 17, 1882, The Mystery, Cherry Grove; September 15, 1882, Shannon well No. 1, Cooper district.

Bullion, Pa., Division.—Bullion run and its surroundings in Venango county. Commenced producing oil in May, 1876, Phillips Bros.' well No. 1.

Allegheny County, N. Y., Division.—Richburg, Bolivar, Genesee, Alma, etc., in Allegheny county, N. Y. Commenced producing oil in June, 1879, Triangle well No. 2, about four barrels; July, 1880, Triangle No. 3, about 15 barrels; May, 1881, Richburg No. 1, about 35 barrels.

Allegheny County, Pa., Division.—Wildwood, Bakerstown, Belleview, McKees Rocks, McCurdy, Oakdale, Noblestown, Crafton and Bridgeville.

Washington, County, Pa., Division.—Washington, Canonsburg, Finney, Coffeys Crossing, Taylorstown, McDonald, Cecil and Burgettstown.

Green County, Pa., Division.—Fonner, Mount Morris, Nineveh, Bristoria, Leppo, Deep Valley, New Freeport, Dunkard and Davistown.

Mannington, W. Va., Division.—Mannington Downs, Fairview, Flat run, Whetstone, Campbell's run, Cunningham and Bartholomew's run.

Smithfield, W. Va., District.—Smithfield, Robinson's Mills, Brink, Folsom and Dead Fall.

Harrison County, W. Va., Division.—Wolf Summit, Salem, Wallace, Dewey Town, Big Isaac, Lynchburg, Marshville, Ten Mile and Grass run.

Lewis County, W. Va., Division.—Camden, Sand Fork, Riverside and Fink.

Doddridge County, W. Va., Division.—Sedalia,

INTERIOR VIEW OF H. W. RANK'S BLACKSMITH SHOP



WOLF SUMMIT OIL FIELD

WOLF SUMMIT, W. VA.



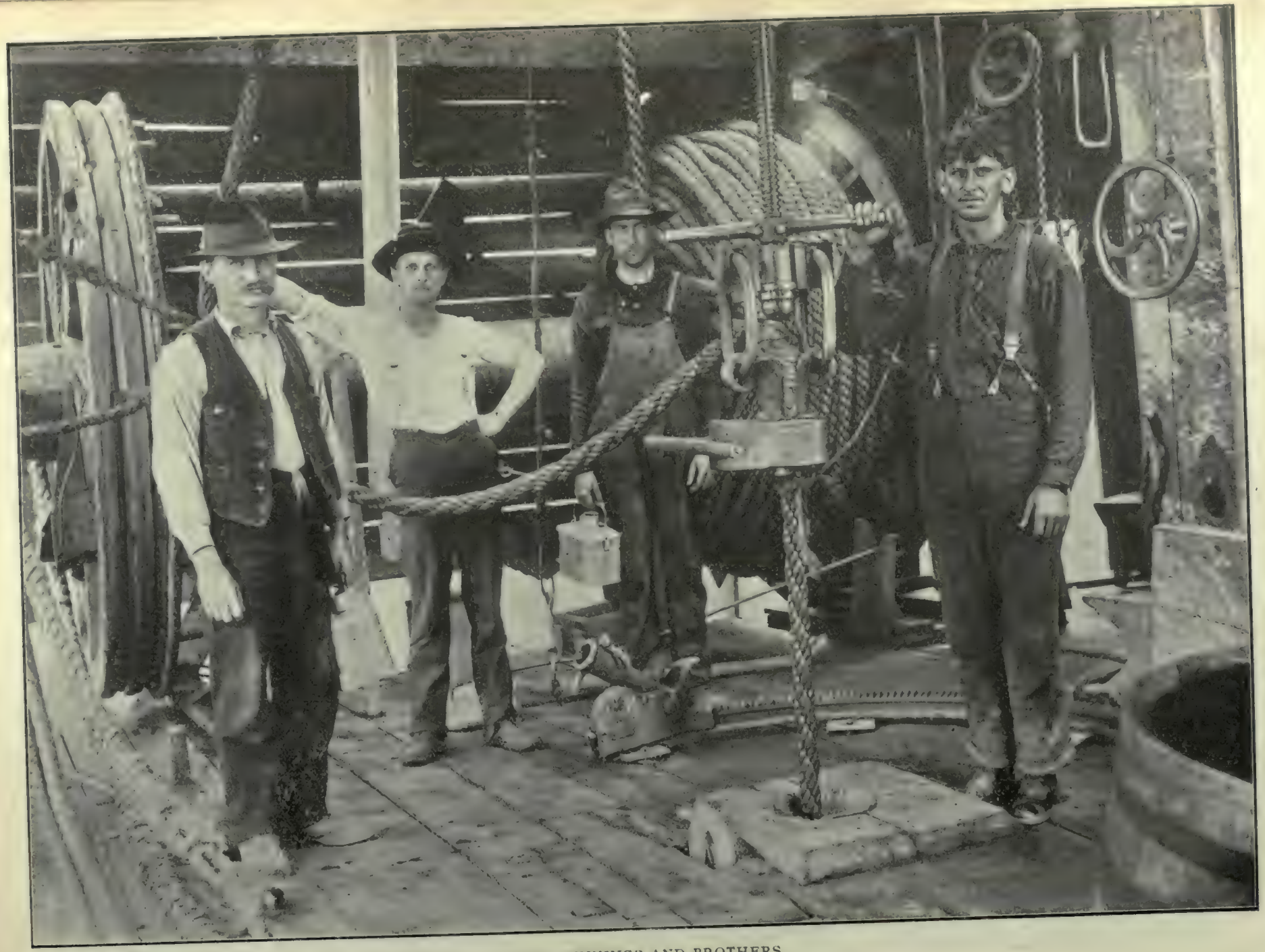
BELL'S CAMP (1,450 FEET ABOVE SEA LEVEL)

FAIRVIEW RIDGE, HEAD OF STEEL'S RUN, WETZEL COUNTY, W. VA.



LOT—JACKSONBURG (OIL FIELD)

Jacksonburg, W. Va.



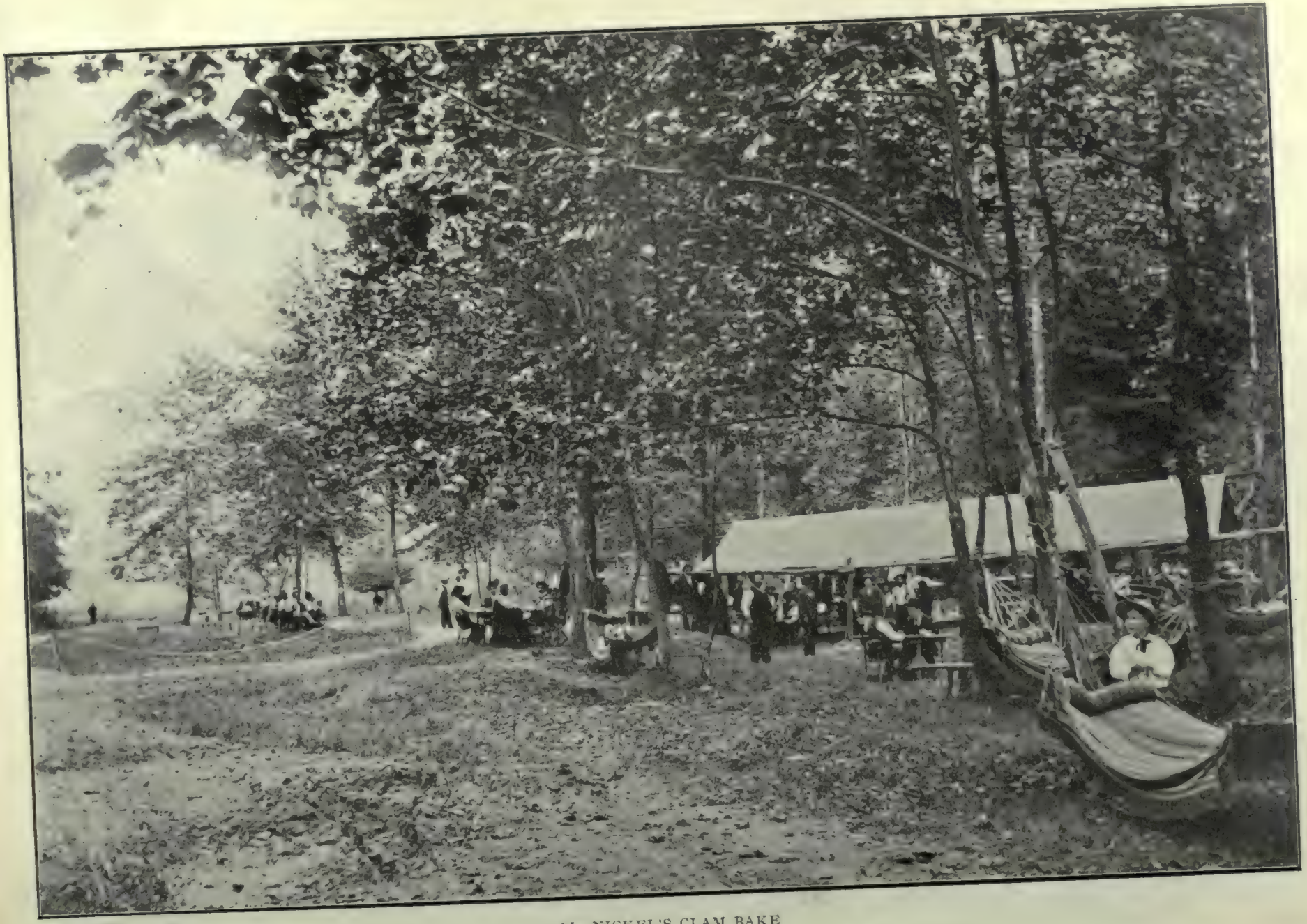
E. H. JENNINGS AND BROTHERS

JOHN GORBY FARM, WELL NO. 2, DRILLING. STEEL'S RUN, WETZEL COUNTY, W. VA.



MANNINGTON OIL FIELD

(Burt Oil Company's Wells) Mannington, W. Va.



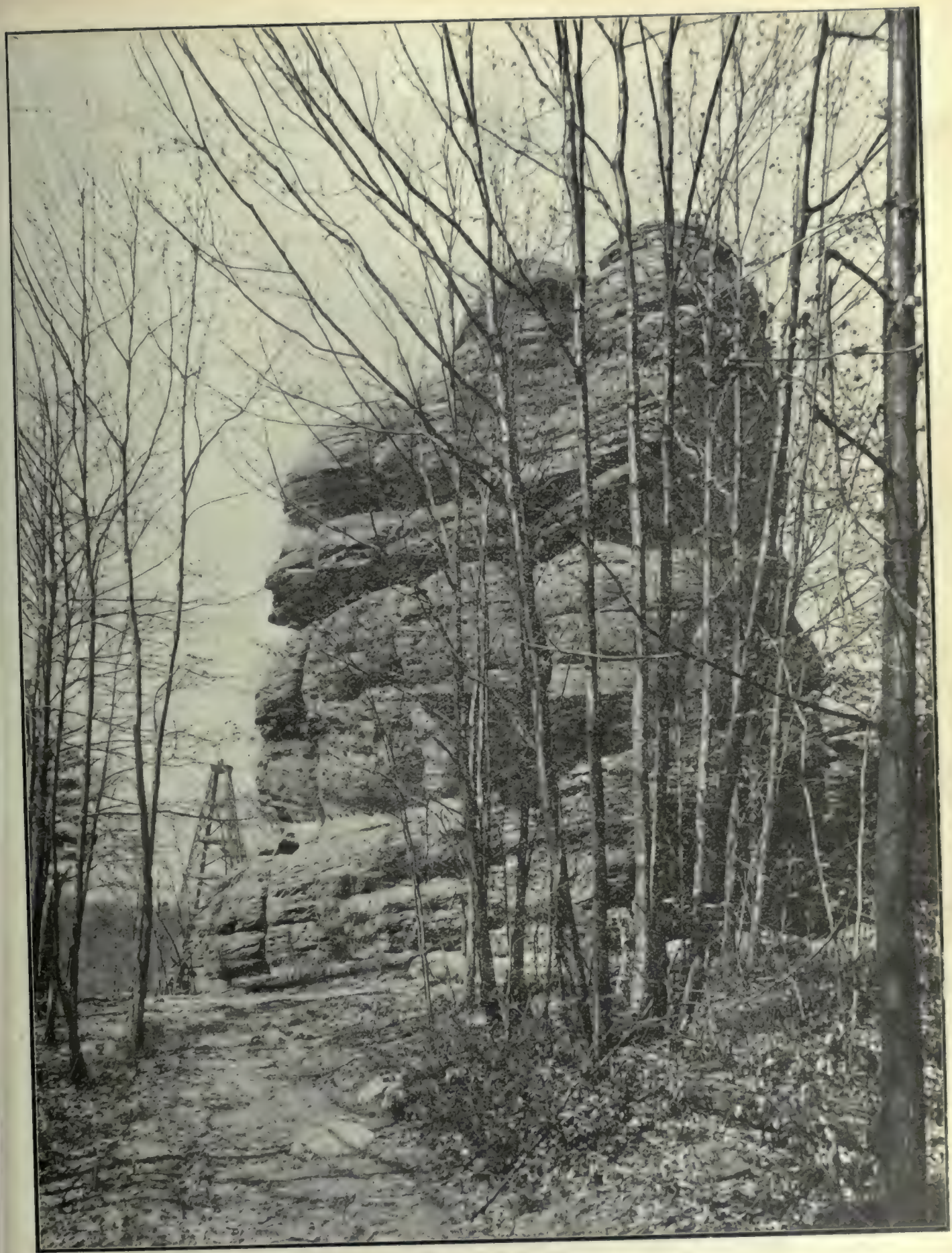
AL. NICKEL'S CLAM BAKE

(Smithfield Oil Field, Sept. 11, 1897) Smithfield, W. Va.



AL. NICKEL'S CLAM BAKE

(Smithfield Oil Field, Sept. 11, 1897) Smithfield, W. Va.



LONE ROCK (OIL FIELD)

ROCK CITY, NEW YORK

GUFFEY AND GALEY
LUCAS WELL
SPINDLE TOP, BEAUMONT TEXAS
THE LARGEST WELL IN AMERICA



COLONEL JAMES M. GUFFEY
THE REAL DISCOVERER OF OIL AT BEAUMONT TEXAS.



CAPT A. S. LUCAS
THE FIRST MAN TO ADVANCE THE THEORY THAT OIL COULD BE FOUND AT BEAUMONT TEXAS.

STRUCK JANUARY 9th 1901
ESTIMATED PRODUCTION 25000 BBLS.
PER DAY OF 23 GRAVITY OIL

SPINDLE TOP OIL FIELD—BEAUMONT, TEXAS.



HEATING BIT
CALIFORNIA OIL FIELD



DRESSING BIT
CALIFORNIA OIL FIELD



DRILLING WELL
CALIFORNIA OIL FIELD



FISHING JOB
CALIFORNIA OIL FIELD



CASING WELL
CALIFORNIA OIL FIELD



CASING WELL
CALIFORNIA OIL FIELD



OIL FIELD
IN LOS ANGELES, CALIFORNIA.



OPERATING OIL WELLS IN THE
OCEAN; NEAR SANTA BARBARA, CALIFORNIA.

OUTLINE MAP

OF THE LEADING NATURAL GAS FIELDS AND GAS PIPE LINES IN THE LARGEST NATURAL GAS PRODUCING STATES.



COPYRIGHTED BY CHARLES A WHITESHOT IN THE YEAR 1904

BIG MOSES GAS WELL (THE LARGEST NATURAL GAS WELL DRILLED IN THE WORLD)



BIG MOSES GAS WELL (THE LARGEST NATURAL GAS WELL DRILLED IN THE WORLD)

Big Moses, Indian Creek, Tyler County, W. Va.

Fink, Porto Rico, Franks run, Center Point and Big Flint.

Tyler County, W .Va., Division.—Sistersville, Elk Fork, Indian creek, Iuka, Friendly, Middlebourne and Willow Fork.

Wetzel County, W. Va., Division.—Pine Grove, Steele's run, Anderson, Littleton, Showalter and Hundred.

Monongalia County, W. Va., Division.—Beulah Cross Roads, Dolls run, Jake's run, Wadestown, Blacksville and Mericle run

Pleasants County, W. Va., Division.—St. Marys, Belmont, Eureka and Waverly.

Wood County, W. Va., Division.—Hendershot, Ogden, Volcano and Murpheytown.

Ritchie County, W. Va., Division.—Cairo, Pennsboro, McFarland, Whiskey run and Bald Knob.

Wirt County, W. Va., Division.—Petroleum, Burning Springs, Oil run and Sand Diggings.

Calhoun County, W. Va., Division.—Yellow creek

Marshall County, W. Va., Division.—Cameron, Germany, Proctor and Glenn Easton.

Cabell County, W. Va., Division.—Milton.

Marietta and Washington County, Ohio., Division.—Macksburg, Elba, Cow run, Warner, Newport, Lowell, Tunell and Sand Hill.

Scio, Ohio, Division.—Scio, Jewett, Cadiz, Gould, Uniontown, Limestone run, Barnesville and Colerain.

Monroe County, Ohio, Division.—Jackson ridge, Jerusalem, Trail run, Miller's run, New Castle, Woodsfield and Griffith.

OIL AND GAS POOLS.

The maps are intended to show the locations of all the oil and gas pools known at date. In the old fields the pools and belts are outlined with considerable precision, in the new a portion of the tracings are necessarily somewhat hypothetical. It would hardly be possible to trace the exact boundaries in every instance, and, indeed, if they could be so traced, probably some new development would change the shape of the figure before the map could be published. In most cases the productive spots are outlined liberally. Very few of the white sand pools are productive in ever part. They are generally made up of prolific streaks and spots separated by many acres of barren territory.

The northwest and west territory of the great chain of productive pools has been sufficiently drilled to dispel all reasonable hope of finding important extensions of the oil rocks of either the McKean, Warren or Venango-Butler groups in that direction; the southwesterly and easterly limit of the chain seems to be almost as certainly defined; in the central portion of the belt the spaces between the pools have been quite thoroughly drilled in almost every direction in efforts to connect one pool with another or to discover something new. Still there is ample room within the proven lines of possible production for many more oil and gas pools of limited extent, particularly in the southern districts, where the pools are very prolific, and no doubt many more will yet be found. There is also a possibility that deep drilling and widespread prospecting may lead to the discovery of new productive horizons in some parts of the field.

OUTCROP LINES AND ANTICLINALS.

In the southwestern part of Greene county the Olean Sharon conglomerate lies about 2,800 feet beneath the surface; but rising towards the northwest at an average rate of nearly 20 feet to the mile, it gradually approaches the surface, comes up to water level in the Allegheny river near Red Bank and rises to the top of the highest ridges in McKean county, at an altitude of about 2,350 feet above ocean level.

Of course all the overlying rocks rise in a similar manner, and one layer after another comes to the surface in regular succession. First the upper beds outcrop and disappear, then the middle, then the lower.

For the purpose of showing the northerly limits of some of these formations, the approximate geographical ranges of a few important outcrops have been traced on the map, as follows:

Pittsburg coal bed. The great irregularity of this outcrop is due to the influence of the important anticlinals which traverse this region.

Ferriferous limestone. This rock varying in thickness from five to 20 feet appears to have its best development in Butler county. Along its outcrop it has shrunken materially and when traced underground in the direction of the broken line curving south and west on the map, it thins out and runs into a bed of dark sandy shale so unlike the massive limestone of Butler county that the driller does not even recognize its horizon.

Mahoning sandstone. A broad belt of elevated sandy country marks this outcrop. This is the sand of the Dunkard creek region of Green county.

Olean conglomerate. Only a few isolated outliers of this rock are found north of the line of outcrop indicated on the map and therefore the line defines the extreme northerly limit of all possible coal fields in this part of the state.

The Chestnut, ridge, Laurel hill and Nolo anticlinals are approximately located on the map for the purpose of showing where the great folds of the mountains commence.

OIL FIELDS AND OIL POOLS IN PENNSYLVANIA.

As the oil and gas pools are now so numerous that they could only be referred to by name on the maps the lists are repeated here for the purpose of adding some explanatory notes which seem to be required.

"Unimportant" indicates that sufficient developments have been made to warrant the conclusion that

OUTLINE MAP OF NEW YORK OIL AND GAS FIELDS



no large production need be expected in that locality.

"Gleaning" indicates that small wells are still pumping and new ones of small capacity are being drilled in the field. This process will go on for many years.

NORTHEASTERN OIL FIELDS, "BLACK SANDS," DEVONIAN.

Oil sands fine grained, friable and occasionally containing pinhead pebbles. Color, black, dark brown, chocolate brown and brownish gray. Drillings popularly spoken of as resembling coffee grounds, chocolate or brownish coal ashes. Oil dark, amber, green, occasionally black. Gravity ranging from 36 to 49 degrees.

No. 1. Allegheny district, New York.—Composed of the Central Richburg field and outlying pools of Clarksville, Niles, Wirt, Harding and O'Connor, and Waugh and Porter, the last named producing an amber oil of 40 degrees gravity, while just north of Richburg a few wells produced a very black oil of 35 degrees gravity.

No. 2. Bradford district.—Productive everywhere within the limits outlined. In some localities produces from several horizons, but the great reservoir is the Bradford sand, which varies in thickness from 30 to 100 feet and sometimes encloses shaly beds between its productive members.

No. 3. Bradford-Kinzua pool.—An outlier of the Bradford field, which has furnished some remarkably productive and long lived wells.

No. 4. Smethport pool.—Only two or three very small wells. The oil is amber color, of rather heavy gravity and comes from a brown sand lying apparently about 350 feet below the Bradford sand.

No. 5. Kane pool.—Discovered in November, 1885, by Jos. Craig & Co. Oil from a brown sand 400 feet below the Bradford sand.

No. 6. Wilcox pool.—The first well was drilled here in 1864. It produced some oil and much gas. Other wells were drilled later, resulting in the development of a very prolific gas field and finally, in 1887, and 1888, a number of good oil wells were obtained. The Bradford sand is the principal oil horizon, but two other brown sands lie below it at intervals of about 100 and 200 feet, and contain gas under very strong pressure.

No. 7. Elk county.—Came into prominence early in 1887. Oil derived from brown sands lying below the Bradford sand horizon. The Elk county oil group may be said to include the Smethport, Wilcox (lower sands), Kane and Elk sands, or all the brown sands that are found within the first 400 feet after drilling through the horizon of the Bradford sand.

MIDDLE OIL FIELDS. "WHITE AND GRAY SANDS." DEVONIAN.

Oil sands generally grayish and fine grained, but sometimes white, coarse grained and pebbly in streaks.

Oils, amber; ranging from dark amber to light and varying in gravity from 35 to 50 degrees.

No. 8. Kinzua.—Opened in the summer of 1885. Some large wells flowing from 500 to 800 barrels per day for a short time.

No. 9. Sugar run.—Small wells, uncertain territory. Oil from so-called second sand. Unimportant.

No. 10. Dew Drop.—A small cluster of old wells with comparatively little production. Unimportant.

No. 11. Warren and North Warren.—Developed in 1875. Little new work being done. Unimportant.

No. 12. Clarendon, Wardwell, etc.—This includes the Clarendon, Stoneham, Stone Hill, Glade, Wardwell and Tiona developments. There are dry streaks within its outlines, but it is practically all one field and contains a large number of small but profitable wells, as most of them still flow naturally and with very little expense to the operator. Active developments commenced in 1880.

No. 13. Cherry Grove.—Discovered in May, 1882. Remarkable for large but short lived wells. The pool is now almost depleted.

No. 14. Balltown.—Active developments commenced in the summer of 1882. Now thoroughly developed.

No. 15. Cooper.—Opened in September, 1882. Large wells and prolific pool.

No. 16. Wolf creek.—Indicated by the Hood well in 1883.

SOUTHEASTERN OIL FIELDS, VENANGO, BUTLER SANDS. CATSKILL.

White, yellowish and grayish sandstones. Generally friable and coarse grained and frequently a conglomerate mass of quartz pebbles from one-eighth of an inch to an inch in diameter, well water worn and flattened.

Oils in the northern district generally green to black, in the southern generally amber and sometimes very light colored. Gravities range from 32 to 52 degrees—the green and black oils weighing about 48 degrees.

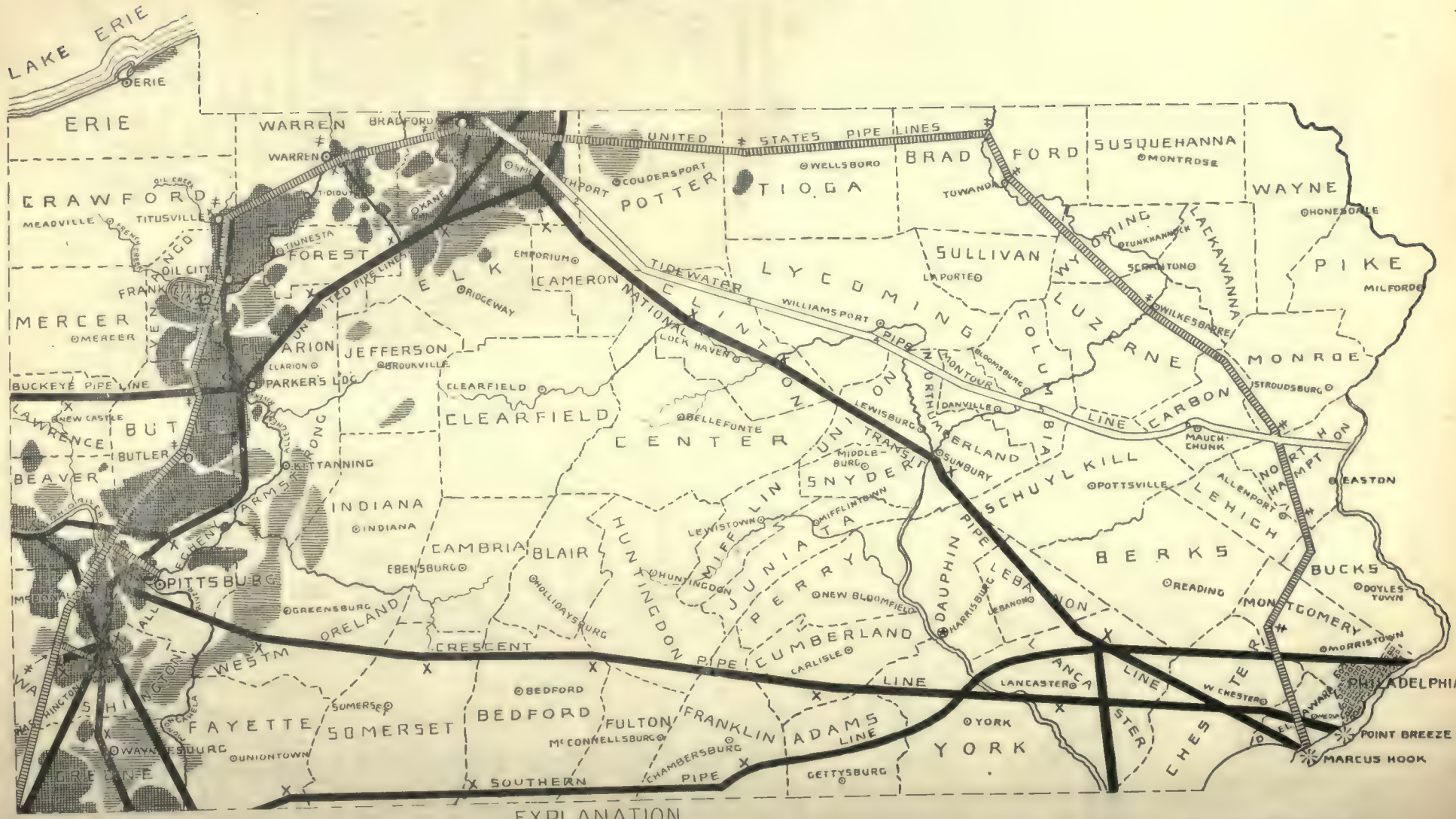
No. 17. Eldred, or Spring creek development.—A number of small wells, producing a green black oil of 47½ degrees gravity from the first sand. Unimportant.

No. 18. Grand Valley.—Dates from 1885. Moderate wells. Third sand. Now pretty thoroughly developed. Gleaning.

No. 19. Tidioute and Triumph.—Includes New London and Colorado. An old and exhausted field. Gleaning.

No. 20. Church run and Octave.—Includes Titusville, Watson Flats, the Drake well, etc. Scene of the

OUTLINE MAP OF THE PENNSYLVANIA OIL AND GAS FIELDS



earliest developments. Production now small. Gleaning.

No. 21. Enterprise.—An old field with very little output. Gleaning.

No. 22. Neilltown.—A development of small extent and notable for the fact that the oil is of an amber color, although it apparently comes from the third or green oil sand. The only instance of the kind in the northern oil field. Gleaning.

No. 23. Fagundus.—A very productive field in 1870. Now reduced to the gleaning from a few wells.

No. 24. Dennis run.—An old black oil district. Unimportant.

No. 25. West Hickory, Fogle, etc.—A cluster of pools, embracing the Neill, Stufflebeam, Fogle, McIntyre, White, McGregory, Greene, Dawson and other farms. Small wells, irregular sands and oils of varying gravities derived from first, second and third sand horizons. Gleaning.

No. 26. Oil Creek, Reno, etc.—Including all the old Oil Creek developments, the Reno belt, Shamburg, Pleasantville, etc., also covers the field of the second sand developments in 1888. Oil from the first, second, stray and third sands, amber, green and black. Gravity 43 to 51 degrees. Gleaning.

No. 27. Pit Hole.—The location of the renowned Pit Hole City oil excitement in 1865.

No. 28. Cashup.—A rich pool in 1872. Now abandoned.

No. 29. Sowers.—Including Jamieson farm. A small well or two of second sand oil in 1865. Unimportant.

No. 30. Tionesta.—A few small wells in olden times, but later tests show the field to be unimportant.

No. 31. Walnut and Henry's Bends.—Two old pools which have produced considerable oil. A few small wells are still at work. Unimportant.

No. 32. McGrew.—A small well in 1888 showing the presence of oil in that locality. Unimportant.

No. 33. Clapp-Fleming.—A new pool of good wells developed in 1888 and still producing.

No. 34. Cooperstown.—Old oil pool. Irregular sands. Unimportant.

No. 25. Sugar creek.—Some heavy oil in former years. Unimportant.

No. 36. Utica.—A little heavy oil. Unimportant.

No. 37. Franklin and vicinity.—Lubricating oil of excellent quality. First sand.

No. 38. Two Mile run.—Second sand oil. Unimportant.

No. 39. Raymilton.—Small but lasting wells. Gleaning.

No. 40 Fosters, Cochran farm, Bully Hill and Lower Two Mile.—Formerly very prolific fields, second and third sands. Gleaning.

No. 41. Sage run.—Old. Gleaning.

No. 42. Hope farm.—Old. Gleaning.

No. 43. Norway.—Old. Gleaning.

No. 44. Tipperary.—Discovered in 1886. Production now small.

No. 45. Cranberry.—Old. Gleaning.

No. 46. Hall's run.—A moderate production and rather uncertain sand rock.

No. 47. Tarr Kill.—Discovered Septemebr 16, 1885. Fine wells. Developed and declining.

No. 48. Gas City.—Old pool. Unimportant.

No. 49. East Sandy.—Some good wells.

No. 50. Scrubgrass.—Old. Abandoned.

No. 51. Bullion.—Once an important field. Gleaning.

No. 52. Red Valley.—A prolific pool in 1886. Gleaning.

No. 53. Nickelville.—Only a few good wells. Very treacherous.

No. 54. Cogley run.—A prolific pool in 1885. Gleaning.

No. 55. Lucinda.—Opened in March, 1889. Of no great importance.

No. 56. Emlenton and Six Corners.—Old fields that have yielded a great deal of oil and still furnish many small wells.

No. 57. Rumbaugh.—Old and never of any importance, as only a few wells were obtained.

No. 58. Clarion.—Developed early in 1888. Some very large wells, but soon declined. Limited in extent and disappointing to those who attempted to enlarge it. Oil is from so-called fourth sand, the equivalent of the third of Oil Creek.

No. 59. Reidsburg.—Small wells of amber oil. Unimportant.

No. 60. Clarion-Butler.—Including all the old fields of these districts and Whiskey run, Brady's Bend, Kaylor, Somerville; also the more recent developments of Pontius, Hickey, Herman, etc. Considerable unproductive territory is included within the outlines, but all of it properly belongs to this great oil field. Central parts pretty well developed.

No. 61. Glade.—A limited area, producing oil from the first sand, here called the "hundred foot."

No. 62. Thorn creek, etc.—Including Thorn creek extension, Bald ridge, Reibold and Glade run, not all directly connected, but practically one field. Has furnished very large wells.

No. 63. Saxonburg.—Developed in 1887. Field is not fully outlined.

No. 64. Phillipsburg.—A number of small wells. Not very important.

No. 65. Wild Wood, Legionville and McCurdy.—First wells drilled in 1889-90. Large fields and large wells. Production at present very small.

No. 66. Brush creek.—Opened in November, 1887. A new field of considerable importance.

No. 67. Bakerstown.—Apparently a field of promise but one which has so far been rather disappointing to its developers.

No. 68. Shannopin.—Opened in January, 1886. A very prolific field, but now well defined.

No. 69. Mt. Nebo.—A field of promise in May, 1885, which has never realized the expectations of its prospectors.

No. 70. Murdocksville.—Opened in 1888. A good field.

No. 71. Montour run.—A few small wells. Not considered very promising.

No. 72. Crafton.—1888. A few small wells.

No. 73. Canonsburg.—Some good wells. Oil sands irregular.

No. 74. Taylorstown.—July, 1886. Prolific.
No. 75. Knox.—Developing. Prolific wells.
No. 76. Gordon.—Opened in 1886.
No. 77. Washington.—Commenced with Gantz well, January 1, 1885. Reached its maximum in the summer of 1886.
No. 78. Nineveh.—Opened by Smith well No. 3, August 25, 1888.
No. 79. McDonald.—Opened by K. McDonald well No. 1 August ,1890, largest white sand oil field in the world.

BEREA GRIT. POCONO.

A white to gray sandstone, generally a fine grained rock, but coarse and sometimes pebbly where productive. Oil a beautiful light amber color. Gravity 47 to 49 degrees.

No. 80. Slippery Rock.—One of the early fields. Unimportant.
No. 81. Smith's Ferry.—Old, but still occasionally furnishes a good well along its borders.
No. 82. Turkeyfoot.—Opened in October, 1888.
No. 83. Hookstown.—Opened in May, 1889.

SUB-OLEAN, SHENANGO SANDSTONE. BIG INJUN. POCONO.

A white sandstone of medium grain with some small pebbles. Where the rock is very thick the top is generally a lime sand, which changes gradually to a sandstone. But drillers usually call it sand. Amber oil, gravity 48 degrees.

No. 84. Mount Morris.—Opened in October, 1886. A promising field and still in process of extension.
No. 85. Dolls run.—First well in May, 1889.

MAHONING SANDSTONE, PITTSBURG SERIES.

A grayish white sand, where productive, about 30 feet thick.

Oil reddish amber, gravity 46 degrees, heavy oil in Westmoreland county.

No. 86. Pleasant Unity.—Old. Abandoned.
No. 87. Brownsville.—Old. Never of any importance.
No. 88.—Whiteley creek.—Now of little importance.
No. 89. Dunkard creek.—Now of little importance.



Gas Fields and Gas Pools of Pennsylvania

NORTHERN DIVISION, "BLACK SANDS." DEVONIAN.

No. 1. Mt. Jewett.—Some gas, but no large development. Piped to Mt. Jewett.

No. 2. Kane.—Used locally and piped to Bradford.

No. 3. Wilcox.—First well in 1865. Piped to Bradford, Salamanca, Buffalo, etc.

No. 4. Roy and Archer.—Large gas field in 1881. Used locally in making charcoal and acid from wood.

No. 5. Johnsonburg.—Used locally and piped to Ridgway and St. Mary's.

No. 6. Millstone.—Large gas field. Held in reserve.

WHITE AND GRAY SANDS. DEVONIAN.

No. 7. Sheffield.—Opened by Hague well in 1875. Pioneer well still flowing. Used locally. Piped to Sheffield, Warren, Jamestown, N. Y., Corry and Erie. A large and reliable field.

No. 8. Clarendon.—Used locally and piped to Clarendon.

No. 9. West Hickory.—Opened December, 1887. Piped to Tidioute, etc.

No. 10. Speechley.—Opened early in 1885. Used locally. Piped to Franklin, Meadville, Mercer, Sharon, Oil City, Titusville, Pleasantville, Tionesta, etc.

No. 11. Brookville.—Small supply, partly from the Big Injun and partly from a lower sand. Piped to Brookville.

No. 12. Canoe creek.—Piped to Punxsutawney and other towns. Gas from an horizon certainly as low as the Speechley sand.

VENANGO-BUTLER GROUP. CATSKILL.

No. 13. Newton well.—Piped to Titusville in 1872.

No. 14. Marienville.—Moderate flow. Supplies Marienville.

No. 15. Clarion.—Not voluminous, but piped to Clarion.

No. 16. Millville.—Piped to New Bethlehem, Millville, etc.

No. 17. Harrisville.—Developed in 1885. Intended for Youngsville, Ohio, but found insufficient and not piped there.

No. 18. Centerville.—Piped to Ne wCastle in 1885.

No. 19. Kittanning.—The main pool has supplied Kittanning for several years, but since Ford City was built with its immense plate glass works, and commenced to draw upon it, it has been found necessary to reinforce its supplies. Other wells have been obtained, as noted, on the east side of the river, but nothing which indicates a very extensive deposit has yet been discovered there.

No. 20. Saxon Station.—Considerable gas used locally.

No. 21. Baden.—Piped to towns along Ohio valley.

No. 22. Economy.—Piped to towns along Ohio valley.

No. 23. Bakerstown.—Some good wells.

No. 24. Lardintown.—Piped to Sharpsburg in 1876. Now unimportant.

No. 25. Freeport.—Formerly some gas. Now unimportant.

No. 26. Tarentum.—First well in 1878. A large field in 1885.

No. 27. Leechburg.—First well in July, 1871. Unimportant.

No. 28. Apollo.—Formerly some small wells. Unimportant.

No. 29. Pine run.—Opened January, 1885. Piped to Apollo, Leechburg, Freeport, Natrona, etc., and being introduced in Saltsburg.

No. 30. Homewood.—Opened by Westinghouse well No. 1, in 1884. Gas from Butler gas sand. Unimportant.

No. 31. Murrysville.—First well Haymaker No. 1. Piped to Pittsburg in summer of 1884.

No. 32. Grapeville.—A large field. Piped to Johnstown and towns by the way; to Connellsville, Scottdale, Uniontown and other places in that direction; to Braddock, Pittsburg and also used locally in the great glass works at Jeannette and other places near the belt.

No. 33. Latrobe.—Some moderate wells supplying Latrobe and also connected with the Johnstown line.

No. 34. Beaver.—A large field opened in 1885, already drawn upon heavily and weakening in pressure. Piped to Phillipsburg, Rochester, Beaver Falls and Youngsville, Ohio. Also westerly and southerly to several of the Ohio river towns.

No. 35. Hickory.—A large field opened with the McGuigan well in 1882. Piped to Pittsburg and towns along the line, and to Wheeling and other places southwest. Gas from the McGuigan sand, and in some wells from the Homeward sandstone.

No. 36. Ridgeville.—Piped to Pittsburg, etc., and used locally.

No. 37. Jefferson.—Piped to Jones and McLaughlin's American iron and steel works, Pittsburg.

No. 38. Canonsburg.—First well November, 1884. Piped to Pittsburg and used locally.

No. 39. Washington.—Opened by Hess well, April, 1884. Piped to Washington, etc.

No. 40. Manifold.—Piped to Pittsburg and used locally.

No. 41. Belle Vernon.—Opened in 1887. Piped to Belle Vernon, etc., and connected with Pittsburg.

No. 42. Brownsville.—Some small wells, but not very reliable.

SUB-OLEAN. "BIG INJUN." POCONO.

No. 43. Fayette.—Opened by Ryder well in 1887. One very powerful well and two smaller ones. Piped to Uniontown.

No. 44. Mt. Morris.—Strong gas, used locally and piped to Morgantown, West Virginia.

"Gas used locally," indicates that there is considerable consumption near the wells. Frequently a large quantity is used in drilling other wells, to which it is sometimes piped for miles.

"Unimportant," indicates that the pools have weakened and are now only of local value.

In the city of Erie and along the lake shore many wells, probably 200, have been drilled and more or less gas obtained. Nearly all that country is a low pressure gas field, and while the wells are useless for pipe line purposes, they are long lived and of great value to land owners who, by putting down a well on their own premises, can almost always secure a reliable supply of fuel and light for many years.

No. 45. Green county.—The largest gas producing county in Pennsylvania.

OIL FIELDS AND OIL POOLS IN WEST VIRGINIA.

Northern division.—No. 1. Turkey Foot and New Cumberland; salt sand and Berea grit.

Northeastern division.—No. 2. Mannington, Whetstone, Flaggy Meadow, Downs, Fairview, Jake's run, Doll's run, Mohn's run, Campbell's run, Flat run, Mericle run, Cross Roads, Beulah, Wadestown, Blacksville, Bartholomew's run, Hafer and Cunningham.

Northwestern division.—No. 3. Churche's Fork, Hundred, Littleton, Steel's run, Clover Leaf run, Morris run, Cameron, Germany and Proctor.

Central Smithfield division.—No. 4. Smithfield, Folsom, Dead Fall, Jacksonburg, Mill's tract, Piney, Big Flint, Center Point, Sedalia, Wallace, Wolf Summit, Lynchburg, Deweytown, Salem and Big Isaac.

Southeastern division.—No. 5. Sand Fork, Fink, Freeman's creek and Porto Rico.

Western (Sistersville) division.—No. 6. Sistersville, Friendly, Elk Fork, Indian creek, Jug Handle, Iuka and Willow Fork.

Southwestern (Volcano) division.—No. 7. St. Marys, Belmont, Eureka, Waverly, Hendershot, Ogdon, Murpheytown, Volcano, Cairo, Pennsboro, Bald Knob, Yellow creek, Wriskey run and Burning Springs.

Southern (Cabell county) division.—Milton pool.

OIL FIELDS AND OIL POOLS IN OHIO.

(Producing Pennsylvania high grade oil.)

Southeastern (Marietta) division.—No. 1. Macksburg, Elba, Warner, Cow run, Newport, Lowell, Tunnel and Sand Hill.

Eastern (Ohio) division.—No. 2. Wilson run, Stringtown, Miller's run, Trail run, New Castle, Jackson ridge, Jerusalem and Griffith.

Northeastern (Scio) division.—No. 3. Scio, Jewett, Gould, Limestone run, Knoxville, Yellow creek, Toronto, Bowerstown, Cadiz, Uniontown, Colerain, Barnesville and Cambridge.

OIL FIELDS IN NORTHWESTERN OHIO.

(Trenton Rock.)

Lima, Findlay, North Baltimore, Cygnet, Hammondsburg, Portage, Bowling Green, Jerry City, Oil Center, Cridersville and St. Marys.

OIL FIELDS IN INDIANA.

(Trenton Rock.)

Wells, Blackford, Jay, Adams, Grant, Huntington, Madison, Marion, Miami, Delaware, Randolph, Hamilton and Wabash counties.

OIL FIELDS IN KANSAS.

Neodesha, Chanute, Independence, Iola, Peru, Cherry Vale, Sedan, Coffeyville and Thayer.

OIL FIELDS IN OKLAHOMA AND INDIAN TERRITORY.

Cleveland, Bartlesville, Tulsa, Red Forks, Muskeege and Chelsea.

OIL FIELDS IN COLORADO.

Florence and Boulder.

OIL FIELDS IN CALIFORNIA.

Santa Paula, Newhall, Torry Canon, Bakersfield, Los Angeles, Whittier, Summerlands, Puenta, Colinga and McKiterick.

LEADING OIL COMPANIES IN CALIFORNIA.

Union Oil Company of California. Directors: Wallace L. Hardison, Santa Paula; Lyman, Stewart, Los Angeles; Dan McFarland, Los Angeles; T. R. Bard, Hueneme; W. S. Chaffee, San Buenaventura; Alexander Waldic, Santa Paula; John Irwin, Santa Paula; I. H. Warring, Santa Paula; Casper Taylor, Santa Paula. Certificate filed October 17, 1890. Place of business, Santa Paula, Cal. Capital stock, $5,000,000. Number of shares, 50,000; value per share, $100.

The Consolidated Oil Companies of California, 1902; capitalization $1,000,000; combining Rex Crude Oil Company, Yukon Crude Oil Company, American Fuel Oil Company, Union Consolidated Crude Oil Company. Officers: Allen McD. Riddell, president; Charlton W. Canfield, vice president; W. H. Kent, secretary and treasurer. Wells and leases in Los Angeles and Kern counties, Cal.

Associated Oil Company.
Occidental Oil Company.
Peerless Oil Company.
Imperial Oil Company.
Sterling Oil Company.
Monte Cristo Oil Company.

OIL FIELDS IN WYOMING.

Salt creek field in Natrona and Johnson counties.
Powder river field in Natrona and Johnson counties.
Oil mountain field in Natrona county.
Rattlesnake field in Natrona county.
Arago field in Natrona county.
Dutton field in Natrona and Fremont counties.
Beaver field in Fremont county.
Popo-Agie field in Fremont county.
Lander field in Fremont county.
New Castle field in Weston county.
Douglas field in Converse county.
Carter field in Unita county.
Hillard field in Unita county.
Spring Valley field in Unita county.
Twin Creek field in Unita county.
Bonanza field in Big Horn county.
Shoshone field in Fremont county.

OIL FIELDS IN TEXAS.

Spindle Top, Beaumont, Sour Lake, Batson, Corsicana and Nacogdoches.

Beaumont, Texas, field, on 200 acres of ground more than 400 wells were drilled. The field is known as the Spindle Top.

OIL FIELDS IN LOUISIANA.

Jennings and Welch.

PETROLEUM.

REPORT BY F. H. OLIPHANT.
United States Geologist.

(The barrell used in this report, unless otherwise specified, is the United States standard barrel, containing 42 Winchester gallons.)

IMPORTANT FEATURES OF THE YEAR.

The following are the most conspicuous features in the production, sale and export of crude petroleum and its products in the United States for the year 1903:

1. The production was greater than that of any previous year.

2. The great increase was due to the remarkable output in California, now larger than that of any other state, and to a less extent to the increased production in Indiana, Kansas, Kentucky and Louisiana, and to the larger production maintained by Texas.

3. The ramarkably regular output of the Appalachian and the Lima-Indiana fields combined has continued for many years, but the large production of late in the newer fields of the south and west has caused a rapid shifting of the proportions or percentages of the whole output from the older to the newer fields, where a large quantity of the inferior grades of petroleum is consumed for fuel, especially in California, Texas and Louisiana.

4. The general average price paid for crude petroleum was greater by 14.07 cents per barrel than the average price for 1902. The average price paid for Pennsylvania petroleum showed an increase of 35.25 cents; and the average price in the Lima-Indiana field was about 27 cents per barrel more in 1903 than in 1902.

5. Stocks held in tanks in both the Appalachian and the Lima-Indiana fields were considerably decreased during the year.

6. There was a slight decline in the quantity of all grades of petroleum exported during 1903, and a slight gain in the value of the same when compared with that of 1902. There was a decided decrease in the quantity of the illuminating petroleum exported, and a considerable increase in both quantity and value of the lubricating petroleum exported during 1903 over the previous year.

7. The demand for home consumption continued to increase during 1903, the western demand being partly supplied by refineries in Texas, Kansas and Colorado.

INCREASE IN THE PRODUCTION OF THE UNITED STATES.

The total production of crude petroleum in the United States in 1903 was 100,461,337 barrels, being larger than that of any previous year and greater than that of 1902 by 11,694,421 barrels, a gain of 13.17 per cent as compared with a gain of 27.92 per cent in 1902 over 1901. The greatest part of the increase during 1903 was from the state of California, which in 1903 produced 24.27 per cent, or nearly one-fourth of the entire production. This state in 1902 produced 15.75 per cent of the whole production, 12.66 per cent in 1901, and only 6.79 per cent in 1900. The increase in California in 1903 was 10,398,204 barrels, or 74.36 per cent of the production of 1902.

Next to California the largest gain in production was in Indiana, which was 1,705,515 barrels, or 22.80 per cent of the production of 1902. Kansas showed a remarkable gain in production of 600,465 barrels, or 181 per cent; Kentucky and Louisiana showed gains of about 369,000 barrels each; Indian Territory gained 101,811 barrels, or 274.4 per cent; and New York gained 43,248 barrels, or 3.86 per cent in 1903, as compared with 1902.

On the other hand there was a slight decrease of 128,086 barrels, or 0.708 per cent in Texas; and Ohio, Pennsylvania and West Virginia all showed decreased production, amounting to a total of 1,856,619 barrels, or 3.98 per cent in 1903, as compared with 1902. The largest decrease in production in 1903 was in Pennsylvania, and amounted to 708,724 barrels.

PERCENTAGE OF PRODUCTION BY FIELDS AND STATES.

The following table reveals the fact that in the last six years there has been a very remarkable change in the percentage of the local production. The Appalachian and Lima-Indiana fields, which for many years produced all but a very small percentage of the whole, in the year 1903 produced only 55.38 per cent of the total as compared with 93.99 per cent in 1898. The Appalachian and the Lima-Indiana fields have continued regularly for the last 10 years to produce about 55,000,000 barrels per year. California has increased its production since 1900 in the most remarkable manner, so that during 1903 it produced 127,921 more barrels of petroleum than did the states of Pennsylvania and West Virginia combined. Texas has also been a very important factor in bringing about the readjustment of the percentatges of production. The production in Texas in 1903 was only slightly less than in 1902, but the great increase in California caused Texas to show a much less percentage of the total in 1903 than in 1902; in 1902, in fact, the Texas percentage of the total production was greater than that of California. All the other states combined under the head of all other fields, show an increase in 1903 of nearly one per cent over 1902, which in round numbers represents 1,000,000 barrels.

Percentages of crude petroleum produced in the several fields, 1898-1903.

Field.	1898	1899	1900	1901	1902	1903
Appalachian	57.29	57.94	57.05	48.45	36.07	31.41
California	4.08	4.63	6.79	12.66	15.75	24.27
Lima-Indiana ..	36.70	35.44	34.20	31.61	26.31	23.97
Texas	.98	1.17	1.31	6.33	20.37	17.87
All other	.95	.82	.65	.95	1.50	2.48
Total	100.00	100.00	100.00	100.00	100.00	100.00

The increased production in the states of Texas, Louisiana and California of large quantities of an inferior grade of petroleum during the years 1902 and 1903 required for its consumption new markets and new conditions of transportation that were unknown to the older fields, and also demanded that a large amount of capital be suddenly invested in tanks, pipe lines, tank cars and tank vessels. The markets and transportation for this new production have been secured to a very large extent; most of the problems connected with its production and transportation have been solved, and during 1903 its consumption for fuel purposes and as an enricher of manufactured gas has been very largely increased.

A very considerable quantity of Texas petroleum has been refined with satisfactory results, although the percentage of the yield is much smaller than from the eastern petroleum. When the value of the petroleum produced in the Appalachian and the Lima-Indiana fields is considered in comparison with that of all the remaining fields, it is found that 82 per cent of the total value comes from the 55.38 per cent of the total production furnished by those fields, the remaining 44.62 per cent of the production receiving 18 per cent of the total value, so that 3.8 barrels of the southern and western petroleum is required to equal the value of one barrel of that produced in the Appalachian and the Lima-Indiana fields.

INCREASE IN PRICE AND TOTAL VALUE.

When the total value of the production, which was $94,694,050, is compared with $71,178,910, the value in 1902, the former shows a gain of $23,515,140, or 33 per cent. The production of Ohio was valued at $26,234,521 in 1903; West Virginia at $20,516,532; Pennsylvania at $18,170,881; Indiana at $10,474,127; Texas at $7,517,479; and California, which produced the largest number of barrels of crude petroleum, was valued at only $7,399,349.

The average price of all the pertoleum produced and marketed during 1903 was 94.26 cents per barrel, as compared with 80.19 cents per barrel in 1902, an increase of 14.07 cents per barrel as compared with a decrease of 15.51 cents per barrel when the value received for the production of 1902 is compared with that of 1901. For the last two years the increasing

quantity of cheaper petroleum produced has had its influence in reducing the average price per barrel of the entire production, notwithstanding that much higher prices were paid for eastern petroleum in 1903 than in 1902.

The average price paid for Pennsylvania petroleum, which is about 95 per cent of the entire production of the Appalachian field in 1903, was $1.59 per barrel, as compared with $1.23¾, the average price paid in 1902. This shows the remarkable gain of 35¼ cents per barrel in the price paid during 1903 over that of 1902. There was also a gain of about 27 cents per barrel in the price paid for the production in the Lima-Indiana field during 1903 over that of 1902. On the other hand, the average price of California petroleum decreased from 34.8 cents per barrel, the lowest price at which any petroleum was marketed during 1903. The price of the Texas petroleum showed a large advance in the average price paid, as the production of 1903 averaged 41.87 cents per barrel as compared with 22.1 cents for that of 1902, a gain of 19.77 cents, or 89 per cent. The highest price quoted during the year was $7 per barrel for the lubricating petroleum produced in Wyoming.

INCREASE IN THE NUMBER OF WELLS DRILLED.

The total number of wells drilled in the United States during the year 1903 was 18,880; of this number 4,650 were dry, leaving 14,230 as the number of productive wells, as compared with 11,326 productive wells in 1902. At an average cost of $1,400 per well, this total number represents an investment in 1903 of $26,402,000.

The total number of wells drilled in the Appalachian and the Lima-Indiana fields during 1903 was 16,232. Of this number 2,889 were dry, leaving 13,343 productive wells. The proportion of productive wells to dry holes in these fields in 1903 was 78½ to 21½, as compared with 80 to 20 in 1902, and with 78 to 22 in 1901.

DECREASE IN EXPORTS.

The exports of petroleum and its products during 1903 was slightly less than 1,000,000,000 gallons. The quantity was 936,699,145 gallons, valued at $72,628,539, a decrease as compared with 1902 of 127,534,456 gallons in quantity, but an increase in value of $4,031,396, chiefly the result of an increased quantity of lubricating petroleum exported in 1903 over the previous year. There was a decline in the quantity of illuminating petroleum exported, accompanied by a slight increase in value.

NEW POOLS DISCOVERED.

The only important pool discovered during 1903 was that known as the Batson Prairie, west of Saratoga, Hardin county, Texas. There were numerous extensions of territory in Kansas and Indian Territory, and a vast amount of territory well inside of limits defined during 1902 was opened and tested. This field began this year to assume a much more important position as productive and profitable territory. The developments in Alaska have not yet sustained the predictions made last year.

PRODUCTION AND VALUE.

Production by States and Fields.

In the following table is given a statement of the total quantity and the total value of all crude petroleum produced in the United States in 1902 and 1903, by states and important districts:

Total quantity and value of crude petroleum produced in the United States and the average price per barrel in 1902 and 1903.

State and District.	1902			1903		
	Quantity	Value	Average price per barrel	Quantity	Value	Average price per barrel
	Barrels			Barre		
California	13,984,268	$4,873,617	$0.348	24,382,472	$7,399,349	$0.303
Colorado	396,901	484,683	1.22	483,925	431,723	.892
Illinois	200	1,000	5.00	.....	.....	.....
Indiana	7,480,896					
Indian Territory	37,100	6,526,622	.872	9,186,411	10,474,127	1.14
Oklahoma Territory		32,940	.888	138,911	142,402	1.025
Kansas	331,749					
Kentucky	185,331	292,464	.88	932,214	988,220	1.06
Tennessee		141,044	.76	554,286	486,083	.877
Louisiana	548,617					
Michigan	757	188,985	.344	917,771	416,228	.4535
Missouri		1,066	1.41	3,000	4,650	1.55
New York	1,119,730	1,530,852	1.367	1,162,978	1,849,135	1.59
Ohio:						
Eastern and southern	5,136,366	6,471,821	1.26	5,585,858	8,881,514	1.59
Lima	15,877,730	14,284,072	.899	14,893,853	17,351,339	1.165
Mecca Belden	135	1,466	10.86	575	1,668	2.90
Total	21,014,231	20,757,359	.988	20,480,286	26,234,521	1.28
Pennsylvania:						
Franklin	50,555	199,432	3.945	48,209	192,836	4.00
Pennsylvania	12,012,125	15,064,861	1.254	11,305,692	17,976,050	1.59
Smith's Ferry	1,200	1,800	1.50	1,255	1,995	1.59
Total	12,063,880	15,266,093	1.265	11,355,156	18,170,881	1.60
Texas	18,083,658	3,998,097	.221	17,955,572	7,517,479	.4187
West Virginia:						
West Virginia Petroleum	13,498,685	17,006,469	1.26	12,893,079	20,499,996	1.59
Volcano	14,660	33,848	2.31	6,316	16,536	2.62
Total	13,513,345	17,040,317	1.261	12,899,395	20,516,532	1.59
Wyoming	6,253	43,771	7.00	8,960	62,720	7.00
Grand total	88,766,916	71,178,910	.8019	100,461,337	94,694,050	.9426

The increase or decrease in the production by states, as well as the percentages of increase or decrease in 1903 compared with 1902, are shown in the following table:

Total production of crude petroleum and percentage of increase or decrease, by states, in 1903, as compared with 1902.

State.	Production		Increase	Decrease	Percentage	
	1902	1903			Increase	Decrease
	Barrels	Barrels	Barrels	Barrels		
California	13,984,268	24,382,472	10,398,204		74.36	
Colorado	396,901	483,925	87,024		21.93	
Illinois	200			200		100.00
Indiana	7,480,896	9,186,411	1,705,515		22.80	
Indian Territory / Oklahoma Territory	37,100	138,911	101,811		274.42	
Kansas	331,749	932,214	600,465		180.99	
Kentucky / Tennessee	185,331	554,286	368,955		199.08	
Louisiana	548,617	917,771	369,154		67.29	
Michigan / Missouri	757	3,000	2,243		296.30	
New York	1,119,730	1,162,978	43,248		3.86	
Ohio	21,014,231	20,480,286		533,945		2.541
Pennsylvania	12,063,880	11,355,156		708,724		5.875
Texas	18,083,658	17,955,572		128,086		.708
West Virginia	13,513,345	12,899,395		613,950		4.543
Wyoming	6,253	8,960	2,707		40.29	
Total	88,766,916	100,461,337	11,694,421		13.17	

RANK OF STATES.

The following tables show the order of production of the several states of the United States, the quantity and value produced by each, and their percentages of the whole in 1902 and 1903:

Rank of petroleum producing states and territories, with quantity produced and percentage of each in 1902 and 1903.

1902.				1903.			
State	Rank	Quantity	Percentage	State	Rank	Quantity	Percentage
		Barrels				Barrels	
Ohio	1	21,014,231	23.67	California	1	24,382,472	24.27
Texas	2	18,083,658	20.37	Ohio	2	20,480,286	20.39
California	3	13,984,268	15.75	Texas	3	17,955,572	17.87
West Virginia	4	13,513,345	15.23	West Virginia	4	12,899,395	12.84
Pennsylvania	5	12,063,880	13.59	Pennsylvania	5	11,355,156	11.30
Indiana	6	7,480,896	8.42	Indiana	6	9,186,411	9.14
New York	7	1,119,730	1.26	New York	7	1,162,978	1.16
Louisiana	8	548,617	.62	Kansas	8	932,214	.93
Colorado	9	396,901	.45	Louisiana	9	917,771	.92
Kansas	10	331,749	.38	Kentucky / Tennessee	10	554,286	.55
Kentucky / Tennessee	11	185,331	.21	Colorado	11	483,925	.48
Indian Territory / Oklahoma Territory	12	37,100		Indian Territory / Oklahoma Territory	12	138,911	
Wyoming	13	6,253		Wyoming	13	8,960	
Michigan / Missouri	14	757	.05	Michigan / Missouri	14	3,000	.15
Illinois	15	200		Illinois	15		
Total		88,766,916	100.00	Total		100,461,337	100.00

The increased production in California during 1903, nearly one-fourth of the entire output of the country, has caused it to appear at the head of the list of producing states in the United states, passing Ohio and Texas from third place to first. Ohio has for many years held this distinction. Kansas has also changed places with Louisiana by a small margin.

When the states are arranged according to the value of the petroleum produced in the United States, and not, as in the first of the preceding tables, according to quantity, there is a considerable readjustment for the year 1903. As in the arrangement for 1902, Ohio is first in the list and leads West Virginia by a large percentage. Next in line after West Virginia is Pennsylvania, third, followed by Indiana. Texas is fifth. California is sixth in the list of values, credited with only 7.81 per cent of the total value, though it produced 24.27 per cent of the quantity. Louisiana is eleventh in the list of values and ninth in the list according to quantity.

Rank of petroleum producing states and territories, with value of production and percentage of each, in 1902 and 1903.

1902.				1903.			
State	Rank	Value	Percentage	State	Rank	Value	Percentage
Ohio	1	$20,757,359	29.16	Ohio	1	$26,234,521	27.70
West Virginia	2	17,040,317	23.94	West Virginia	2	20,516,532	21.66
Pennsylvania	3	15,266,093	21.45	Pennsylvania	3	18,170,881	19.18
Indiana	4	6,526,622	9.17	Indiana	4	10,474,127	11.06
California	5	4,873,617	6.85	Texas	5	7,517,479	7.93
Texas	6	3,998,097	5.62	California	6	7,399,349	7.81
New York	7	1,530,852	2.15	New York	7	1,849,135	1.95
Colorado	8	484,683	.68	Kansas	8	988,220	1.04
Kansas	9	292,464	.41	Kentucky	9	486,083	.51
Louisiana	10	188,985	.26	Tennessee			
Kentucky	11	141,044	.20	Colorado	10	431,723	.45
Tennessee				Louisiana	11	416,228	.49
Wyoming	12	43,771	.....	Indian Territory	12	142,402	.15
Indian Territory	13	32,940	.11	Oklahoma			
Oklahoma				Wyoming	13	62,720	.....
Michigan	14	1,066	.....	Michigan	14	4,650	.07
Missouri				Missouri			
Illinois	15	1,000	.....	Illinois	.....	.....	.....
Total	.....	$71,178,910	100.00	Total	.....	$94,694,050	100.00

PRODUCTION BY FIELDS AND STATES.

The production of petroleum in the principal fieldsof the United States from 1898 to 1903, inclusive, was as follows:

Production of petroleum in the United States, 1898-1903, by fields and states.
(Barrels of 42 gallons.)

FIELD.	1898	1899	1900	1901	1902	1903
Appalachian	31,717,425	33,068,356	36,295,433	33,618,171	32,018,787	31,558,248
Lima-Indiana	20,321,323	20,225,356	21,758,750	21,933,379	23,358,626	24,080,264
California	2,257,207	2,642,095	4,324,484	8,786,330	13,984,268	24,382,472
Colorado	444,383	390,278	317,385	460,520	396,901	483,925
Kansas	71,980	69,700	74,714	179,151	331,749	932,214
Texas	546,070	669,013	836,039	4,393,658	18,083,658	17,955,572
Louisiana	.....	.....	.....	.....	548,617	917,771
Indian and Oklahoma Territories	.....	.....	.....	.....	37,100	138,911
Wyoming	5,475	5,560	5,450	5,400	6,253	8,960
Other	370	492	8,274	12,585	957	3,000
Total	55,364,233	57,070,850	63,620,529	69,389,194	88,766,916	100,461,337

This table, showing the production by fields and states in the United States from 1898 to 1903 clearly illustrates the remarkable persistency with which the older fields continue to produce. The regularity of the combined production of the Appalachian and the Lima-Indiana fields is quite marked. Taking the nearest million barrels, the following is the result: 1898, 52 millions; 1899, 53 millions; 1900, 58 millions; 1901, 55.5 millions; 1902, 55.4 millions, and 1903, 55.6 millions. Nearly all the other fields and states show a surprisingly continuous growth since 1896.

COMBINED VALUES OF PETROLEUM AND NATURAL GAS IN 1903.

Petroleum and natural gas combined rank next to pig iron and coal in the list of values of the crude mineral products of the United States in 1903, as is shown in the following table:

Value of petroleum and natural gas produced in 1903, their combined value and percentage, and rank of combined value by states.

State	Value of crude petroleum	Value of Natural Gas	Value of petroleum and natural gas	Percentage	Rank
STATE.					
Pennsylvania	$18,170,881	$16,182,834	$34,353,715	26.32	1
Ohio	26,234,521	4,479,040	30,713,561	23.53	2
West Virginia	20,516,532	6,882,359	27,398,891	20.99	3
Indiana	10,474,127	6,098,364	16,572,491	12.70	4
Texas	7,517,479	21,351	7,538,830	5.79	5
California	7,399,349	104,521	7,503,870	5.77	6
New York	1,849,135	493,686	2,342,821	1.79	7
Kansas	988,220	1,123,849	2,112,069	1.62	8
Kentucky					
Tennessee	486,083	390,601	876,684	.65	9
Colorado					
Louisiana	431,723	14,140	445,863	.34	10
Indian Territory	416,228	.....	416,228	.32	11
Oklahoma Territory	142,402	1,000	143,402	.11	12
Arkansas					
Wyomong	62,720	2,460	65,180		13
Missouri					
Michigan	4,650	7,070	11,720	.07	14
South Dakota	.....	10,775	10,775		15
Illinois	.....	3,310	3,310		16
Total	$94,694,050	$35,815,360	$130,509,410	100.00	

PRODUCTION OF CRUDE PETROLEUM IN UNITED STATES FROM 1859 TO 1903, INCLUSIVE.

In the table following will be found a statement of the production of crude petroleum in the United States from the beginning of production, marked by the drilling of the Colonel Drake well in 1859, up to and including the production of 1903, the table being by years and states.

Production of petroleum in the United States, 1859-1903, by years and by states.
(Barrels of 42 gallons.)

Year	Pennsylvania and New York	Ohio	West Virginia	California	Kentucky & Tennessee	Colorado	Indiana
1859	2,000	.....	.....	.....	.....	.....	.....
1860	500,000	.....	.....	.....	.....	.....	.....
1861	2,113,609	.....	.....	.....	.....	.....	.....
1862	3,056,690	.....	.....	.....	.....	.....	.....
1863	2,611,309	.....	.....	.....	.....	.....	.....
1864	2,116,109	.....	.....	.....	.....	.....	.....
1865	2,497,700	.....	.....	.....	.....	.....	.....
1866	3,597,700	.....	.....	.....	.....	.....	.....
1867	3,347,300	.....	.....	.....	.....	.....	.....
1868	3,646,117	.....	.....	.....	.....	.....	.....
1869	4,215,000	.....	.....	.....	.....	.....	.....
1870	5,260,745	.....	.....	.....	.....	.....	.....
1871	5,205,234	.....	.....	.....	.....	.....	.....
1872	6,293,194	.....	.....	.....	.....	.....	.....
1873	9,893,786	.....	.....	.....	.....	.....	.....
1874	10,926,945	.....	.....	.....	.....	.....	.....
1875	8,787,514	200,000	3,000,000	175,000	.....	.....	.....
1876	8,968,906	31,763	120,000	12,000	.....	.....	.....
1877	13,135,475	29,888	172,000	13,000	.....	.....	.....
1878	15,163,462	38,179	180,000	15,227	.....	.....	.....
1879	19,685,176	29,112	180,000	19,858	.....	.....	.....
1880	26,027,631	38,940	179,000	40,552	.....	.....	.....
1881	27,376,509	33,867	151,000	99,862	.....	.....	.....
1882	30,053,500	39,761	128,000	128,636	160,933	.....	.....
1883	23,128,389	47,632	126,000	142,857	4,755	.....	.....
1884	23,772,209	90,081	90,000	262,000	4,148	.....	.....
1885	20,776,041	661,580	91,000	325,000	5,164	.....	.....
1886	25,798,000	1,782,970	102,000	377,145	4,726	.....	.....
1887	22,356,193	5,022,632	145,000	678,572	4,791	76,295	.....
1888	16,488,668	10,010,868	119,448	690,333	5,096	297,612	.....
1889	21,487,435	12,471,466	544,113	303,220	5,400	316,476	33,375
1890	28,458,208	16,124,656	492,578	307,360	6,000	368,842	63,496
1891	33,009,236	17,740,301	2,406,218	323,600	9,000	665,482	136,634
1892	28,422,377	16,362,921	3,810,086	385,049	6,500	824,000	698,068
1893	20,314,513	16,249,769	8,445,412	470,179	3,000	594,390	2,335,293
1894	19,019,990	16,792,154	8,577,624	705,969	1,500	515,746	3,688,666
1895	19,144,390	19,545,233	8,120,125	1,208,482	1,500	438,232	4,386,132
1896	20,584,421	23,941,169	10,019,770	1,252,777	1,680	361,450	4,680,732
1897	19,262,066	21,560,515	13,090,045	1,903,411	322	384,934	4,122,356
1898	15,948,464	18,738,708	13,615,101	2,257,207	5,568	444,383	3,730,907
1899	14,374,512	21,142,108	13,910,630	2,642,095	18,280	390,278	3,848,182
1900	14,559,127	22,362,730	16,195,675	4,324,484	62,259	317,385	4,874,392
1901	13,831,996	21,648,083	14,177,126	8,786,330	137,259	460,520	5,757,086
1902	13,183,610	21,014,231	13,513,345	13,984,268	185,331	396,901	7,480,896
1903	12,518,134	20,480,286	12,899,395	24,382,472	554,286	483,925	9,186,411
Total	640,919,590	304,231,603	144,600,691	66,216,945	1,187,498	7,336,851	55,022,626

Production of crude petroleum in the United States, 1859-1903, by years and by states.—Concluded.

Year	Illinois	Kansas	Texas	Missouri	Indian Territory	Wyoming	Louisiana	United States
1859	.....	.....	.....	.....	.....	.....	.....	2,000
1860	.....	.....	.....	.....	.....	.....	.....	500,000
1861	.....	.....	.....	.....	.....	.....	.....	2,113,609
1862	.....	.....	.....	.....	.....	.....	.....	3,056,690
1863	.....	.....	.....	.....	.....	.....	.....	2,611,309
1864	.....	.....	.....	.....	.....	.....	.....	2,116,109
1865	.....	.....	.....	.....	.....	.....	.....	2,497,700
1866	.....	.....	.....	.....	.....	.....	.....	3,597,700
1867	.....	.....	.....	.....	.....	.....	.....	3,347,300
1868	.....	.....	.....	.....	.....	.....	.....	3,646,117
1869	.....	.....	.....	.....	.....	.....	.....	4,215,000
1870	.....	.....	.....	.....	.....	.....	.....	5,260,745
1871	.....	.....	.....	.....	.....	.....	.....	5,205,234
1872	.....	.....	.....	.....	.....	.....	.....	6,293,194
1873	.....	.....	.....	.....	.....	.....	.....	9,893,786
1874	.....	.....	.....	.....	.....	.....	.....	10,926,945
1875	.....	.....	.....	.....	.....	.....	.....	12,162,514
1876	.....	.....	.....	.....	.....	.....	.....	9,132,669
1877	.....	.....	.....	.....	.....	.....	.....	13,350,363
1878	.....	.....	.....	.....	.....	.....	.....	15,396,868
1879	.....	.....	.....	.....	.....	.....	.....	19,914,146
1880	.....	.....	.....	.....	.....	.....	.....	26,286,123
1881	.....	.....	.....	.....	.....	.....	.....	27,661,238
1882	.....	.....	.....	.....	.....	.....	.....	30,510,830
1883	.....	.....	.....	.....	.....	.....	.....	23,449,633
1884	.....	.....	.....	.....	.....	.....	.....	24,218,438
1885	.....	.....	.....	.....	.....	.....	.....	21,858,785
1886	.....	.....	.....	.....	.....	.....	.....	28,064,841
1887	.....	.....	.....	.....	.....	.....	.....	28,283,483
1888	.....	.....	.....	.....	.....	.....	.....	27,612,025
1889	1,469	500	48	20	.....	.....	.....	35,163,513
1890	900	1,200	54	278	.....	.....	.....	45,823,572
1891	675	1,400	54	25	30	.....	.....	54,292,655
1892	521	.....	45	10	80	.....	.....	50,509,657
1893	400	18,000	50	50	10	.....	.....	48,431,066
1894	300	40,000	60	8	130	2,369	.....	49,344,516
1895	200	44,430	50	10	37	3,455	.....	52,892,276
1896	250	113,571	1,450	43	170	2,878	.....	60,960,361
1897	500	81,098	65,975	19	625	3,650	.....	60,475,516
1898	360	71,980	546,070	10	.....	5,475	.....	55,364,233
1899	360	69,700	669,013	132	.....	5,560	.....	57,070,850
1900	200	74,714	836,039	1,602	6,472	5,450	.....	63,620,529
1901	250	179,151	4,393,658	2,335	10,000	5,400	.....	69,389,194
1902	200	331,749	18,083,658	757	37,100	6,253	548,617	88,766,916
1903	.....	932,214	17,955,572	3,000	138,911	8,960	917,771	100,461,337
Total	6,576	1,959,707	42,551,796	8,299	193,565	49,450	1,466,388	1,265,751,585

The entire production of petroleum in the United States since it was first discovered in 1859 amounts to 1,265,751,585 barrels. If we allow 5.6 cubic feet for the cubical contents of each barrel, the number of cubic feet would be 7,088,208,876, which would require a cube whose sides would be 1,921 feet in each direction; or the oil would fill a tank whose base is one square mile to a height of 254 feet. If we allow 3½ barrels to be the equivalent of one ton of average coal, this number of barrels represents 361,643,310 tons of coal. The total quantity of all the coal produced in the United States during 1902 was 301,590,439 short tons.

Of the grand total of all the crude petroleum produced since the beginning in 1903 Pennsylvania produced 50.6 per cent, Ohio 24 per cent, West Virginia 11.4 per cent, California 5.23 per cent, Indiana 4.34 per cent, and Texas 3.36 per cent, leaving only one per cent to be supplied by the remainder of the states producing petroleum.

DECREASE IN APPALACHIAN FIELD.

This field embraces all the districts producing what is popularly known as Pennsylvania oil. It extends from Wellsville, in New York state on the northeast, down through western Pennsylvania into West Virginia, includes a large portion of southeastern Ohio, and extends across the states of Kentucky and Tennessee into Alabama. The production in Kentucky is becoming more important each year. That of Tennessee has remained almost stationary for the last 10 years, being confined to one locality near its northern border. Alabama has not yet produced any merchantable quantity of petroleum.

The year 1903 showed in all the states which go to

make up the Appalachian field a decrease in production of 460,879 barrels, or about 1.44 per cent, the comparatively small increase in the production in New York, southeastern Ohio and Kentucky and Tennessee not being sufficient to offset the larger decrease in Pennsylvania and West Virginia.

The following table gives the production of the Appalachian states in 1902 and 1903 with the percentage of their increase or decrease. A part of the production in Ohio comes from another field, known as the Lima-Indiana field, but is not included in this table.

Production of petroleum in the Appalachian field in 1902 and 1903, by states, showing increase or decrease

State	Production		Increase	Decrease	Percentage	
	1902	1903			Increase	Decrease
	Barrels	*Barrels*	*Barrels*	*Barrels*		
New York	1,119,730	1,162,978	43,248	.....	3.86	.....
Pennsylvania	12,063,880	11,355,156	.....	708,724	.....	5.875
West Virginia	13,513,345	12,899,395	.....	613,950	.....	4.543
Southeastern Ohio	5,136,501	5,586,433	449,932	.....	8.76	.....
Kentucky and Tennessee	185,331	554,286	368,955	.....	199.08	.....
Total	32,018,787	31,558,248	.....	460,539	.....	1.439

INCREASE IN LIMA-INDIANA FIELD.

This field embraces a portion of northwestern Ohio and Central Indiana. The petroleum in this field comes from the Trenton limestone and carries a small percentage of sulphur. The petroleum from the Appalachian field is found almost entirely in sandstone, and is generally known as white sand oil; it is free from sulphur, produces a larger percentage of illuminating oil, and is more easily refined. There was a decrease in 1902 and 1903 in the production in that portion of the Lima-Indiana field lying in Ohio, which was more than offset by the increased production in Indiana. The increase in the Indiana portion during 1903 was 1,705,515, and the decrease in that portion of the field in Ohio was 983,877 barrels, a gain of 721,638 barrels, or 3.09 per cent.

Production of petroleum in the Lima-Indiana field in 1902 and 1903.

State	Production		Increase	Decrease	Percentage	
	1902	1904			Increase	Decrease
	Barrels	*Barrels*	*Barrels*	*Barrels*		
Ohio	15,877,730	14,893,853	.....	983,877	.....	6.196
Indiana	7,480,896	9,186,411	1,705,515	.....	22.80	.....
Total	23,358,626	24,080,264	721,638	.....	3.09	.....

WELLS AND STOCKS IN APPALACHIAN AND LIMA-INDIANA FIELDS.

In the tables following are shown the number of wells completed and of dry holes in the Appalachian and Lima-Indiana fields for the years 1902 and 1903:

Number of wells completed and of dry holes in the Appalachian and Lima-Indiana fields in 1902 and 1903, by months.

1902.

Month	Appalachian		Lima-Indiana		Total both fields	
	Completed	Dry	Completed	Dry	Completed	Dry
January	582	169	436	58	1,018	227
February	455	132	325	44	780	176
March	514	158	411	44	925	202
April	579	186	418	46	997	232
May	648	161	547	60	1,195	221
June	745	214	656	81	1,401	295
July	685	166	614	55	1,299	221
August	725	149	638	65	1,363	214
September	730	194	650	78	1,380	272
October	713	176	627	84	1,340	260
November	729	209	648	64	1,377	273
December	617	217	490	46	1,107	263
Total	7,722	2,131	6,460	725	14,182	2,856

1903.

January	490	139	384	31	874	170
February	513	159	432	39	945	198
March	495	140	493	32	988	172
April	664	159	523	38	1,187	197
May	715	178	710	62	1,425	240
June	839	227	810	72	1,649	299
July	781	194	765	72	1,546	266
August	846	216	823	85	1,669	301
September	814	198	720	56	1,534	254
October	815	223	750	73	1,565	296
November	824	218	733	56	1,557	274
December	678	163	615	59	1,293	222
Total	8,474	2,214	7,758	675	16,232	2,889

Of the entire number of wells drilled in both fields in 1903, 82 per cent were productive, as compared with 80 per cent in 1902, with 78.6 per cent in 1901, and with 80.6 per cent in 1900, which indicates the remarkable character of the general result in securing paying wells. The total number of wells drilled and operated in these two fields during 1903 is estimated at 133,500.

Stocks of petroleum held by pipe lines at close of 1899, 1900, 1901, 1902 and 1903 in the Appalachian and Lima-Indiana fields.

(Barrels of 42 gallons.)

	1899	1900	1901	1902	1903
National Transit Co.	7,615,626	8,174,506	5,069,782	1,456,556	1,037,458
Southwest Pennsylvania Pipe Line Co.	1,560,443	1,368,892	865,477	505,270	706,769
Eureka Pipe Line Co.	1,593,080	1,401,201	1,465,606	1,440,810	1,009,472
Buckeye Pipe Line Co. (Macksburg oil)	674,583	591,899	476,491	606,492	472,150
Cumberland Pipe Line Co.	.....	.....	128,574	279,493	408,378
Southern Pipe Line Co.	396,256	471,599	391,892	326,448	429,547
Crescent Pipe Line Co.	73,633	103,808	126,052	87,822	154,177
New York Transit Co.	756,120	533,030	330,666	184,804	7,504
Tidewater Pipe Co.	294,265	334,308	345,643	418,504	287,782
Producers' and Refiners' Oil Co.	140,966	148,769	139,868	283,154	241,987
Elk Oil Co.	597	595	628	2,093	.....
Emery Pipe Line Co.	25,102	20,252	22,470	25,483	14,128
United States Pipe Line Co.	33,148	25,857	57,271	82,198	53,847
Other lines	287,372	300,832	215,072	42,497	31,516
Total stocks Appalachian field	13,451,191	13,475,548	9,635,492	5,741,624	4,854,715
Total Lima-Indiana stocks	10,545,927	14,988,928	17,760,306	17,306,426	15,138,637
Total both fields	23,997,118	28,464,476	27,395,798	23,048,050	19,993,352

This table shows that the stocks of oil held by various pipe line companies in iron tanks decreased 3,054,698 barrels in 1903. The whole Appalachian field revealed a decline in the net stocks of 886,909 barrels. The stocks of the Lima oil suffered a reduction of 2,167,789 barrels. Stocks at the close of 1903 were the smallest of the last five years. Since 1900 there has been a decrease in stocks in the eastern and Ohio-Indiana oil regions of 8,471,124 barrels. The Appalachian stocks have been drawn upon very heavily within the five years covered by the above table, owing to the increasing demand for the products of the high grades of oils. In the early eighties, when the production of the great Bradford field was at its

zenith, and the Trenton rock districts of Ohio and Indiana were an unknown factor in the petroleum supply, the stock of surplus oil stored in iron tanks rose to 40,000,000.

PRODUCTION BY FIELDS, STATES AND DISTRICTS.

The detailed results of the petroleum operations in the Appalachian oil field in 1903, by states, fields and districts, and in the Lima-Indiana field, are represented in the pages that follow. A portion of both these fields is embraced within the geographical limits of Ohio, and the discussion of production, wells, etc., for both will be found under the head of Ohio.

APPALACHIAN OIL FIELD.

This is the oldest field, and has the distinction of having the first well drilled to develop petroleum. Other wells scattered over a large portion of the territory, in the search for salt brines, had shown the existence of petroleum, but the well drilled by Col. E. L. Drake and his associates in 1859, near Titusville, Pa., was the first one drilled especially in search of the petroleum that was supposed to be stored in the sand rocks in that region. Upon the success of this venture the development of this great industry hinged.

This well was the first of over 150,000 that have been completed within the area of the great Appalachian field, involving the outlay of at least $270,000,000. This great field follows the northwest flank of the Appalachian uplift, extending in a general southwest direction from New York to Alabama, a distance of about 650 miles, and reaching over into Ohio near its northwestern extension. It includes within its area at least 50,000 square miles. This field embraces all of the producing region of New York, Pennsylvania, West Virginia, Kentucky, Tennessee and the southeastern portion of Ohio, with a range of strata in the geological scale beginning with the upper productive coal measures and extending into the lower Silurian. The greater portion of the oil comes from the open and pebble sandstones beginning with the Pocono. extending down to the middle Chemung, and including the upper Chemung, Catskill or Venango group. A small portion of the petroleum produced in Kentucky and Tennessee is found in the upper and lower Silurian formations. The greater portion of the petroleum produced in this field is of a superior quality, and includes the largest quantity of the most valuable products when compared with the crude products of any of the other fields in the United States or of the world. The very easy manner in which the crude petroleum of this great field is refined and the superior quality of the illuminating and lubricating products derived from it have given to the United States the prestige of building up the great industry which it now possesses.

The Appalachian field produced 31.41 per cent of the entire production of the United States in 1903, 36.07 per cent in 1902, 48.45 per cent in 1901, and 57.05 per cent in 1900. Of the entire output of petroleum in the United States this field has produced 70 per cent.

Its original operators set the example which has been followed in all the producing regions of the world; its products are the standard of excellence in all countries, and its methods, both of obtaining the products from their rocky reservoirs and of transporting them, have been introduced into all other petroleum producing countries.

The productive areas in eastern and central Kentucky and in northern-central Tennessee have, in 1903, been completely connected with the pipe line system formerly extending to central West Virginia. Now there is a system of pipe lines reaching from Braden, W. Va., to Lacy, Pickett county, Tenn., a distance of 270 miles, with branch lines 85 miles in length to the Ragland, Barboursville and Floyd county, Ky., pools. These states will be more thoroughly developed in the near future.

No new pools worthy of the name were developed in 1903; the new work was mostly directed toward extending the known pools, which in several instances proved moderately successful. The operators in the older portions of this field have generally applied themselves to the more economical production of the older wells, the cheap source of power secured in the natural gas engine and the easy method of transmitting electric power over some of the rugged hills of West Virginia having cheapened the cost of operating. The natural gas engine has been universally applied in all of the producing pools of these fields, and owing to its great economy and its capacity to run without a constant attendant, it has become profitable to pump small wells in clusters that would otherwise have to be abandoned.

Old wells that were abandoned have been cleaned out and have been made to become small producers. Greater efforts were also made to keep the walls of the producing wells free from paraffin by the use of hot water and steam, and thereby increase their output. Occasionally they were torpedoed with a light shot and thoroughly cleaned out before pumping began.

NEW YORK AND PENNSYLVANIA.

NEW YORK.

All of the Allegheny county district and a portion of the Bradford district are in the state of New York. The entire production in western New York in 1903 is placed at 1,162,978 barrels, valued at $1.59 per barrel, or $1,849,135, an increase in quantity of 43,248 barrels, or 3.86 per cent, and in value of $318,283 over the production of 1902.

New York occupied the seventh place, when rank is considered, for both 1902 and 1903. In 1902 it pro-

duced 2.15 per cent of the total value of the entire production, as compared with 1.95 per cent in 1903.

A considerable portion of the Bradford field extends over into southern central New York, hence the production of New York and Pennsylvania are considered together. Oil territory is no respecter of state lines, and where the districts extend over the dividing lines between two states the statistics of wells completed, of field operations and of production are extremely difficult to separate and are generally combined.

PENNSYLVANIA.

In this state the original well was successfully drilled for petroleum in 1859. Since that first well was completed it is estimated that in this state alone not less than 63,000 wells have been drilled. Of this number 23,000 were dry and have been abandoned. This leaves an average of 40,000 wells in operation during 1903, which produced 11,355,156 barrels of petroleum, an average of 284 barrels for each well, or a production of nearly one barrel per well for each working day throughout the year. Of the entire production of petroleum in the United States since the beginning, amounting at the close of 1903 to 1,265,751,585 barrels, the state of Pennsylvania produced 50.6 per cent. During the year 1895 Ohio, from its two producing fields, obtained for the first time a greater production than Pennsylvania. Pennsylvania held fifth place in rank, and produced 11.30 per cent of the entire output of the United States in 1903; and it ranked third in value of production in both 1902 and 1903, the value of the output in 1903 being $18,170,881, or 19.18 per cent of the total, as compared with 21.45 per cent in 1902.

There was a general decline in all of the districts in Pennsylvania, except in the lower district and the Beaver county district, the greatest decline being in the Allegheny and Washington districts. The total decline amounted to 708,724 barrels, or 5.87 per cent. This decrease is rather remarkable when it is remembered that the average price paid for the product in 1903 was 33½ cents greater than the average price paid in 1902.

Nothing in the way of new pools was developed during the year, except that near the Butler and Armstrong county line some Speechly sand wells were productive The main business of the operators seems to have been in securing the greatest production possible at the least cost and the drilling of a few wells around the edges of the developed territory. There was some activity in the Speechly and fourth sand pools, near the old Modoc pool in Butler county during the year. The production in many of the older fields has been seriously affected by the drainage of the rock, and the last dregs are secured with increased expense and discouragement.

Franklin district.—This district is in Venango county, being a subdivision of the lower district in the neighborhood of Franklin. It has long been celebrated for the production of the finest natural lubricating petroleum found in the United States or elsewhere. It gives a cold and fire test that is unequaled by any other. It is used on a large number of railroads in this country and to a considerable extent on many of the foreign roads.

The lubricating petroleum is found in the first sand, which has a thickness of 50 feet, at a comparatively shallow depth, and is associated with large quantities of salt water. The wells are small producers and a large amount of salt water is pumped with the petroleum. The whole area covers a space of about 16 square miles. The wells are operated and pumped in clusters of from 50 to 100 each by a single power, many of them producing only a few gallons daily. The depth of these wells on the French creek bottom is only about 300 feet.

The gravity of the natural lubricating petroleum found in the old field is 32 degrees Beaume; in the area outside of the older territory, but bordering on it, the gravity is 34 degrees Beaume. Its fluidity is not seriously affected by a temperature of zero.

The production of this variety of lubricating petroleum has been quite steady for many years in this district. In 1903 the production declined slightly, the total being 48,209 barrels, valued at $4 per barrel, or $192,836, as compared with 50,555 barrels, valued at $199,432, in 1902.

SOUTHEASTERN OHIO.

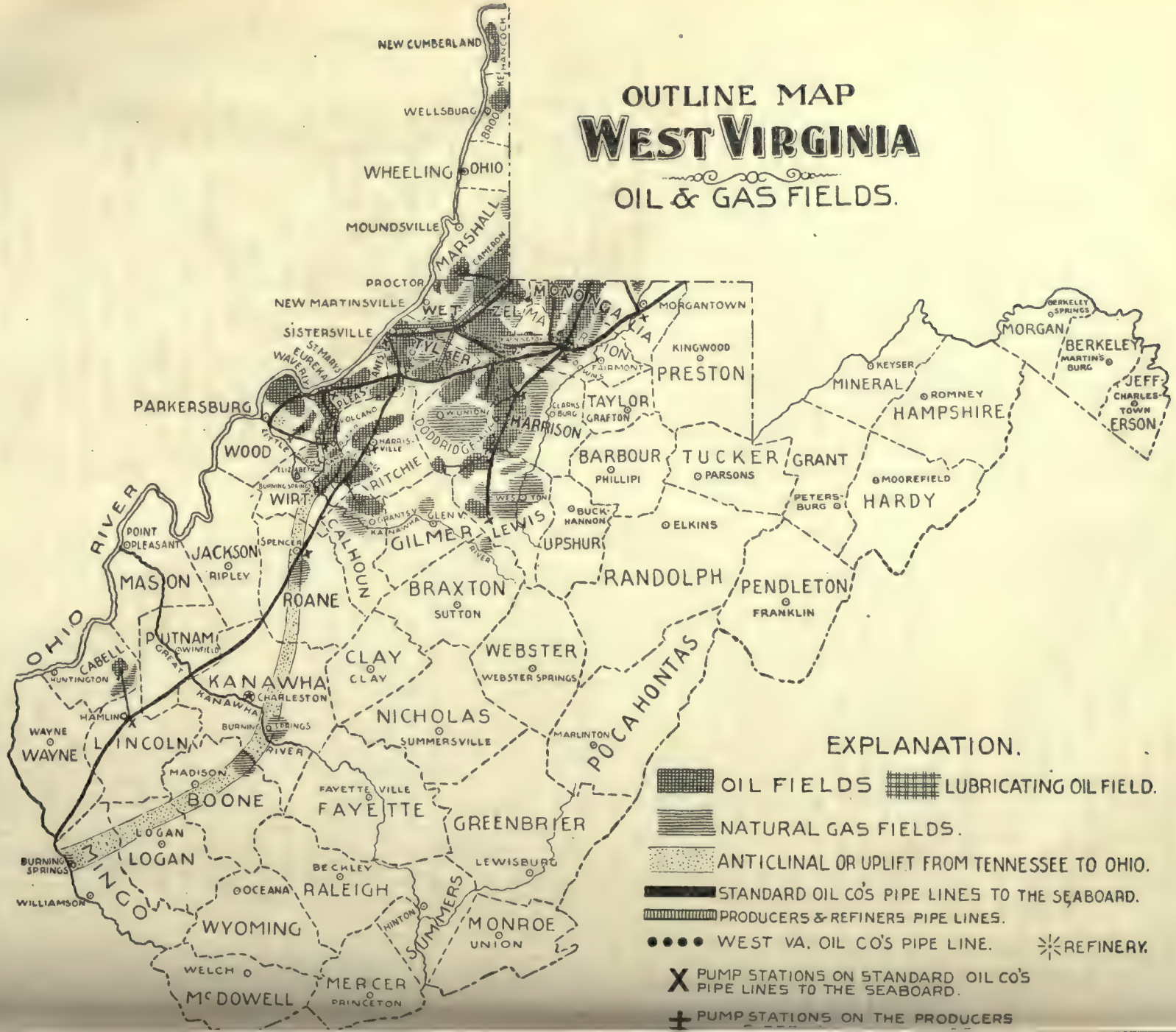
That portion of Ohio which produces what is known as Pennsylvania oil, in contradistinction to the Trenton rock product of the northwestern part of the state, and which belongs to the Appalachian field, will be found described at greater length further on in this report under the general head of Ohio.

WEST VIRGINIA.

Operations in West Virginia during 1903 were confined almost entirely to the development of the known petroleum producing areas. Nearly all the counties and pools showed a slight decline in the number of wells drilled. The county of Hancock, in the Panhandle of the state, appears for the first time in the list of counties, with 71 wells to its credit. There was a decided decline in the new work in Marshall county and in the Sand Fork and Sistersville pools. In September a new well developed a considerable production in the eastern portion of Cabell county near Milton, which started off at 60 barrels per day. This well was considerably in advance of any known productive territory. Since the opening of this new pool a number of wells have been drilled, some of which have given promise of being fair producers, although the general result can hardly be said to be satisfactory.

The production of West Virginia in 1903 was 12,899,395 barrels, a decline of 613,950 barrels, or 4.54 per cent, when compared with 1902. The decline of 1902 as compared with 1901 was 4.70 per cent, and the production was 12.5 per cent less in 1901 than in 1900, when the maximum production was reached.

West Virginia has for several years produced more of what is known as Pennsylvania petroleum than has Pennsylvania and New York combined. The very


OUTLINE MAP
WEST VIRGINIA
OIL & GAS FIELDS.
NEW CUMBERLAND
WELLSBURG
WHEELING
OHIO
MOUNDSVILLE
MARSHALL
PROCTOR
NEW MARTINSVILLE
WETZEL
MONONGALIA
MORGANTOWN
SISTERSVILLE
TYLER
PRESTON
KINGWOOD
PARKERSBURG
WOOD
TAYLOR
GRAFTON
HARRISON
BARBOUR
PHILLIPI
TUCKER
PARSONS
GRANT
MINERAL
KEYSER
ROMNEY
HAMPSHIRE
MORGAN
BERKELEY SPRINGS
BERKELEY
MARTINSBURG
JEFFERSON
CHARLESTOWN
WIRT
RITCHIE
DODDRIDGE
WESTON
BUCKHANNON
ELKINS
PETERSBURG
MOOREFIELD
HARDY
OHIO RIVER
POINT PLEASANT
JACKSON
RIPLEY
MASON
CALHOUN
ROANE
GILMER
LEWIS
UPSHUR
RANDOLPH
PENDLETON
FRANKLIN
BRAXTON
SUTTON
PUTNAM
WINFIELD
CLAY
WEBSTER
WEBSTER SPRINGS
CABELL
HUNTINGTON
KANAWHA
CHARLESTON
NICHOLAS
SUMMERSVILLE
POCAHONTAS
MARLINTON
WAYNE
LINCOLN
MADISON
BOONE
FAYETTE
FAYETTEVILLE
GREENBRIER
LEWISBURG
LOGAN
BECKLEY
RALEIGH
OCEANA
WILLIAMSON
WYOMING
SUMMERS
HINTON
MONROE
UNION
WELCH
MERCER
PRINCETON
McDOWELL
EXPLANATION.
OIL FIELDS
LUBRICATING OIL FIELD.
NATURAL GAS FIELDS.
ANTICLINAL OR UPLIFT FROM TENNESSEE TO OHIO.
STANDARD OIL CO'S PIPE LINES TO THE SEABOARD.
PRODUCERS & REFINERS PIPE LINES.
WEST VA. OIL CO'S PIPE LINE.
REFINERY.
PUMP STATIONS ON STANDARD OIL CO'S PIPE LINES TO THE SEABOARD.
PUMP STATIONS ON THE PRODUCERS

deeply buried sand in this state and the nature of the strata makes the drilling of wells expensive. The average depth of all the wells in West Virginia can not be far from 2,500 feet; usually not less than two strings of casing are required to reach the pays; often three are used. There are some comparatively shallow productive areas in Pleasant, Ritchie, and Wirt counties. In many instances the pools which were productive in the Big Injun sand were also productive in the Gordon sand, about 775 feet under the former. The most productive areas in 1903 were in Tyler and Wetzel counties and in the Folsom district. Near the line of Marion and Harrison counties numerous wells were secured, but the average was considerably less than in the previous year.

Northwest of Pine Grove, in Wetzel county, a number of deep-sand producers were secured. Those drilled on the Showalter farm were nearly all large producers. During the year the Pine Grove extension was practically connected with the Rock run pool farther to the northeast, forming a continuous line of producing wells for 10 miles. To the west and south the opening of the Lemasters well nearly two miles in advance indicated a still further extension of the pool. The Gordon sand pool west of Littleton, Wetzel county, came in as a prominent factor in the way of new production in the latter half of 1903. In the older field the liberal use of high explosives was necessary to keep up the production, and without them the output would have been considerably less. It has been questioned whether the use of these high explosives causes the well, in the end, to increase its output. It does, however, certainly cause the rock to give up its fluid more rapidly for the time being.

There was an average increase in price amounting to about 33 cents per barrel paid for Pennsylvania crude in 1903 over 1902. The whole value of the West Virginia production in 1903 was $20,516,532, as compared with $17,040,317 in 1902. There was therefore a gain in value of $3,476,215, about 20.4 per cent for 4.54 per cent less quantity of petroleum. There is no doubt the increased price paid for the petroleum had a stimulating effect in keeping up the production. West Virginia produced also about $6,000,000 worth of natural gas; when this is added to the value of the petroleum produced it amounts in round numbers to $26,500,000.

The greater portion of the petroleum produced is sold directly to the agents of the pipe lines, who make daily quotations of the price offered at their several purchasing centers, paying cash for their purchases. The tanks of the producers are connected by a series of pipe lines, leading to larger tanks owned by the pipe line company. The petroleum is delivered by the field collectors to main lines, a number of which cross the state from east to west. A large refinery is in operation at Parkersburg.

The total number of wells operated in West Virginia fields in 1903 was 12,600; of this number 1,448 were drilled during the year. The entire number of wells drilled in 1903 was 2,072, and of this number 624 were dry holes, as compared with a total of 2,193 wells drilled in 1902, 649 being dry and 1,544 productive.

The natural gas engine has been a remarkably economical and efficient source of power for operating clusters of wells, and it has in many instances replaced the steam engine. Many localities on the rugged hills of the productive section of this state are very difficult to supply with fuel and water, even where natural gas is used as fuel under the boiler..

The gas engine requires only a small percentage of the gas necessary to use under a boiler to furnish an equal amount of power, besides the boiler requires constant personal attention, whereas the gas engine will furnish a continuous power for many hours unattended.

Within the year the South Penn Oil Company has completed a large electric plant for pumping wells at Folsom, W. Va., near the line of Marion and Harrison counties, which promises to work a revolution in the pumping, pulling and drilling of wells in that section, when the dynamo is substituted for the gas or steam engine. This plant has a capacity for pumping 200 wells. The building is of brick; the engine room is 57 by 60 feet. The equipment consits of two triple expansion, condensing engines of 375 horse power, connected directly to two 250 kilowatt general electric, 3-phase generators, at 300 revolutions per minute, supplying 600 volts. The steam is supplied by boilers using natural gas fuel. The generators supply the current by local feeders to motors at the wells within a radius of about one mile. For greater distances the current is raised to 6,000 volts and connected with sub stations located as much as two miles from the plant, where it is reduced by transformers and supplied to motors of nearby wells. Each well is equipped with a 10-kilowatt motor governed by an oil brake controller. The motor is geared up to a 30-inch pulley connecting with a large wheel of the standard rig, and usually gives a speed of 20 revolutions per minute to the pump.

As compared with the ordinary plan of using one 25 horse power boiler to supply the engines used in pumping three or four wells with steam through long lines of pipe in wooden boxes, which in wet or cold weather condense a large percentage of the steam, the use of the electric motor presents great advantages since the power is conveyed by wires to the well without serious loss.

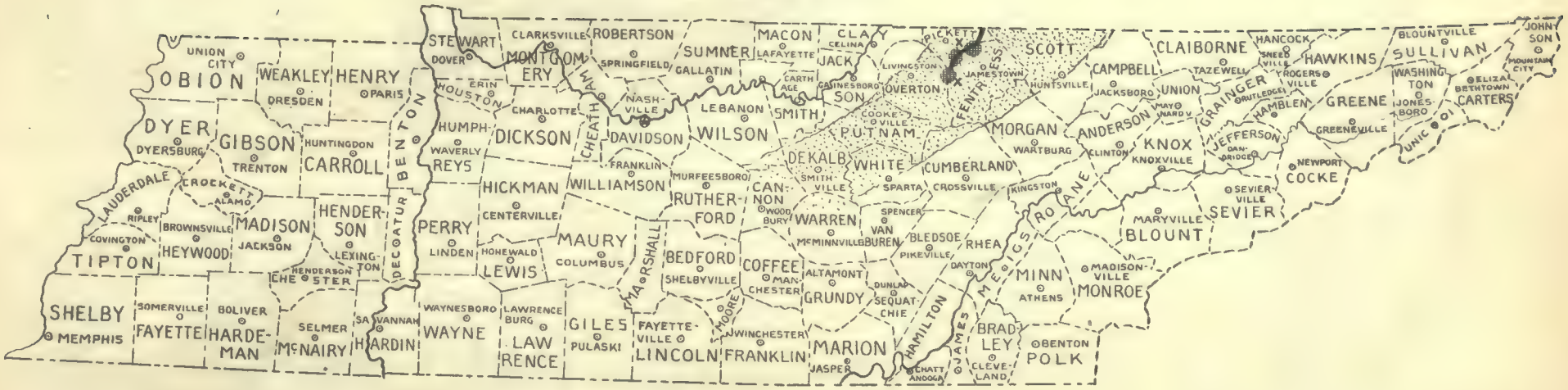
KENTUCKY.

The completion of a pipe line by the Cumberland Pipe Line Company during 1903 gave an outlet for the petroleum produced in southeastern and southern central Kentucky. The entire production of Kentucky and Tennessee during 1903 was 554,286 barrels, of which quantity about 3,700 barrels were produced in Tennessee. This is a gain of almost 200 per cent. A considerable portion of this increase was in the hands of the producers at the close of 1902 and remained unsold, awaiting the completion of the pipe line. The opening of the pipe line and the high price of the crude petroleum were the incentives for a large amount of

OUTLINE MAP OF

TENNESSEE

OIL FIELDS



EXPLANATION

OIL FIELDS

ANTICLINAL THROUGH WEST VIRGINIA AND KENTUCKY.

KENTUCKY PIPE LINE (STANDARD OIL CO'S) TO SEABOARD X PUMP STATIONS ON PIPE LINE

new work during 1903. This pipe line enters the state from West Virginia at Clifford, on the Tug river, and extends in a general southwestern direction for 150 miles, passing through the counties of Martin, Johnson, Breathitt, Perry, Osley, Clay and Laurel, to the town of Somerset in Pulaski county. From Somerset a line passes 40 miles farther southwest through Wayne county into Tennessee to the terminus at Lacy, Pickett county, 15 miles south of the state line. Eighty-five miles of branch lines added bring the total up to 275 miles of main line and branches.

The Somerset district produced during 1903 about 46 per cent of the total state output. The district embraces the Slickford, Cooper Sunnybrook and Steubenville pools in Wayne county, which pools produced 90 per cent of the petroleum credited to this district. There was some production in Cumberland and Clinton counties. The Barboursville pool in Knox county produced two varieties of petroleum, one light and the other heavy, the whole production amounting to 12 per cent of the total state production for 1903. The Ragland pool in Bath county, produced 36½ per cent of a heavy, dark petroleum from a great number of shallow wells. The Beaver creek pool in Floyd county furnished 2½ per cent of the total, for which the largest price was paid, amounting to an average of $1.25½ per barrel. The remaining 3 per cent was furnished by Beaver, Cumberland and Barren counties.

Operations in this state have been for the most part to the development of the known pools, except that a good pool was opened in September of 1903 by a well at Steubenville, five miles north of Monticello, in Wayne county, which produced 125 barrels per day when first drilled into the pay.

In Whitley county, near the Tennessee line, a well was drilled during the fall of 1903, which started off at 75 barrels per day, and which caused numerous wells to be located and some of them to be drilled, although at the close of the year the existence of any considerable pool remained to be demonstrated. The Cooper district in Wayne county was the pool which produced the greatest quantity of petroleum during 1903. The Steubenville district was rapidly increasing its production toward the close of the year. Cumberland county developed a number of paying wells which have not as yet been connected with the trunk line and operators are not pushing the production at present. Bath and Rowan counties produced a large portion of the petroleum during 1903 from shallow wells of comparatively small production, which, however, hold up their output in a very remarkable manner. The petroleum produced is dark and heavy and was marketed at an average of 60½ cents per barrel. Barren county produced some petroleum which was shipped by rail to Louisville principally.

Although Kentucky has shown substantial gains since the pipe line facilities have been in operation, and has responded to the stimulus of high prices, yet the production has not increased so rapidly as was expected; the pools so far developed are comparatively small and the yield of the wells usually declines at a rapid rate, all of which is rather discouraging for this new territory. It is, however, by no means developed to any great extent even yet, and there remain many areas to be tested by the drill, some of which in all probability will yield a big return to the fortunate explorers who locate them.

TENNESSEE.

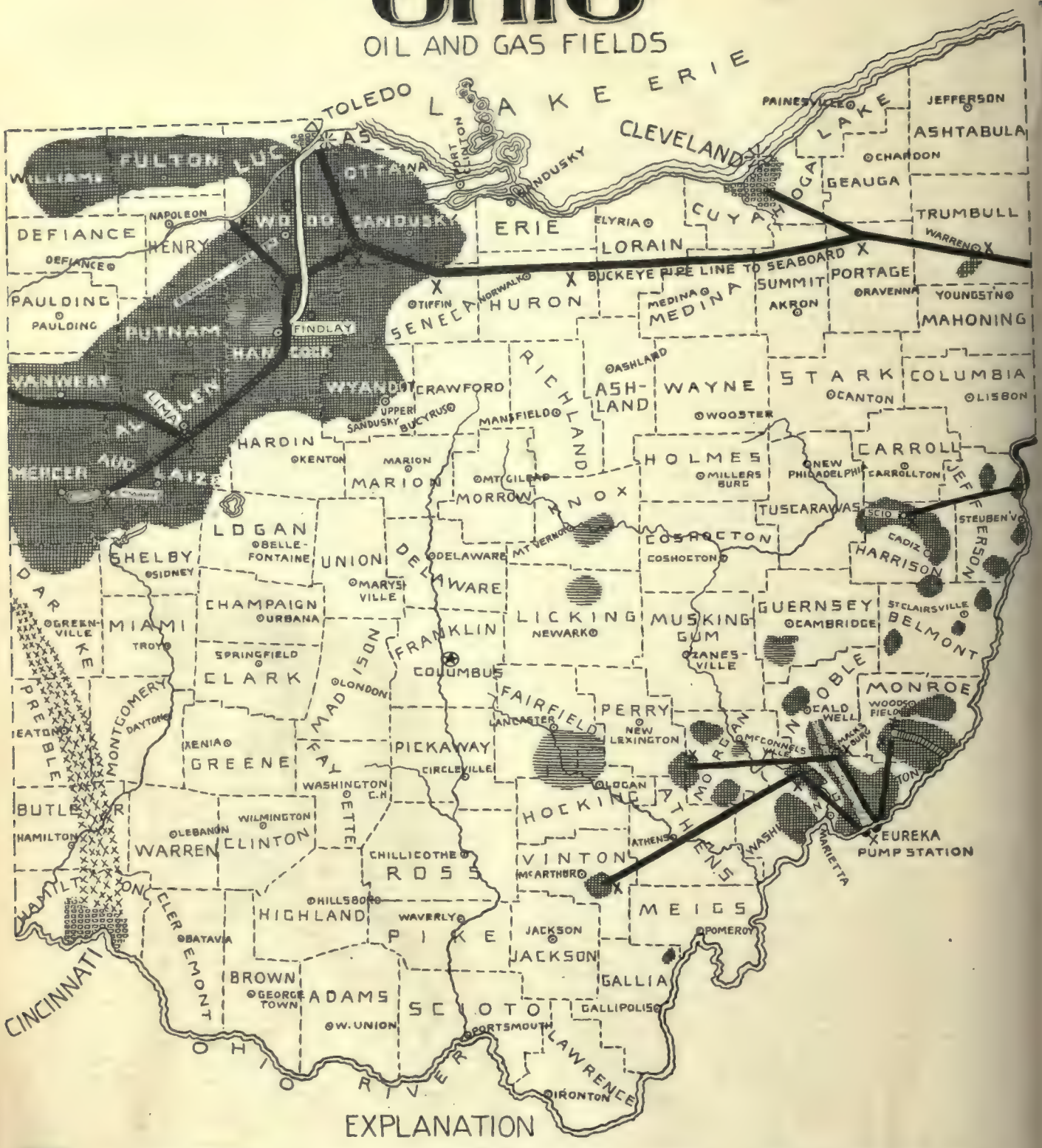
The entire production of Tennessee during 1903 was only 3,703 barrels, nearly all of which came from the old Bobs bar well and wells near it in the Lacy district. A number of test wells were drilled during the year in Fentress and Pickett counties, which failed to find petroleum in paying quantities. Little, however, has been done as yet to test the possibilities of a production of petroleum in this state. There are numerous surface indications of petroleum in a number of localities, some of which have been tested without satisfactory results.

OHIO.

This state produces two well defined grades of petroleum from distinct geological horizons. The older field is generally known as the southeastern Ohio, and the other as the Lima, or northwestern Ohio field. The former produces petroleum of the Pennsylvania type and the latter that grade of petroleum known as Lima oil. The Pennsylvania variety is found in the sandstones of the carboniferous measures, beginning with the lower portion of the Monongahela or upper productive coal measures and extending down to the upper Devonian measures. It embraces all varieties of color and gravity, ranging in color from jet black to straw color and in gravity from 30 to 50 degrees Beaume, the general average delivered to the pipe lines being 43 degrees Beaume. The average gravity of the Lima variety is about 38½ degrees Beaume. This variety is produced at different depths from one formation, known as the Trenton limestone, on the great Cincinnati uplift, and it contains a small percentage of sulphur combined as sulphureted hydrogen, which is difficult to remove in the process of distillation. The southeastern Ohio field has been operated since a few years after the famous Drake well was completed in 1859. The discovery of the Lima field was made in 1885 by persons prospecting for natural gas. This Lima field now produces 72 per cent of the total output and 66.2 per cent of the total value in Ohio. This state, from these two fields, has for a number of years previous to 1903 produced more petroleum than any other. The combined production of the two fields for 1903 was 20,480,286 barrels; and yet the state yields its place at the head of the list to California. The value, however, of the Ohio petroleum production in 1903 was greater than that of any other state, and amounted to $26,234,521, the greatest value in the history of the state's production.

There was a loss in the quantity of the 1903 production, when compared with that of 1902, of 533,945 barrels, but a gain of $5,477,162 in the value of the product. The average price received in 1903 was $1.28 per barrel, as compared with $0.988 in 1902, a gain of 29.2 cents per barrel. The greatest produc-

OUTLINE MAP OF OHIO
OIL AND GAS FIELDS



EXPLANATION

- OIL FIELDS
- NATURAL GAS FIELDS
- LUBRICATING OIL FIELD
- SUN OIL COS PIPE LINE
- STANDARD OIL COS PIPE LINES
- PRODUCERS & REFINERS PIPE LINES
- SUN OIL CO'S PUMP STATIONS
- X STANDARD OIL CO'S PUMP STATIONS
- ‡ PRODUCERS & REFINERS PUMP STATIONS
- STANDARD OIL COS REFINERIES
- △ SUN OIL CO'S REFINERY
- ANTICLINAL THROUGH VOLCANO AND BURNING SPRINGS, WEST VIRGINIA.
- UPLIFT OR ARCH OF THE CINCINNATI ANTICLINAL.

tion, amounting to 1,813,618 barrels, was in the month of July; the least was in February, and amounted to 1,491,586. The year 1903 shows the greatest value and the largest production in the southeastern district of Ohio in the history of the state.

About 44,000 wells were operated during 1903 in all fields. There were 2,233 wells drilled in 1903 in the southeastern portion of the state, and 4,072 wells were completed in the Lima, Ohio, district, a total of 6,305 for both fields, of which number 1,014 were dry and 5,291 were productive wells, as compared with 5,309 wells completed during 1902, of which number 891 were dry and 4,418 were productive wells. There was an average of 452 wells drilling and of 221 rigs building in 1903.

No new pools were opened except a few in southeastern Ohio, the most important being the one near Uniontown, in the northern-central portion of Belmont county, in which a number of productive wells were secured. The original well was drilled during the fall of 1902. The greatest activity was in the Chester hill and the Marietta pools, more than 500 wells being completed in each during 1903.

INDIANA.

This state made, under the stimulation of the high prices paid, remarkable gains in the production of crude petroleum during 1903. No new pools were opened, except that in the latter part of the year a small pool of dark, heavy petroleum was partly developed near Princeton, in Gibson county, near the southeastern corner of the state. Nearly all of the increased production was secured by wells inside defined limits, and in sections where the natural gas pressure had decreased until it was of no great importance and the gas pools had in some instances been developed into petroleum producing areas. It is a field of easy access, being abundantly supplied with pipe lines and other facilities for producing petroleum profitably.

Indiana produced in 1903 the unprecedented output of 9,186,411 barrels, nearly all from the Trenton limestone, valued at $10,474,127, an increase in quantity of 1,705,515 barrels, or 22,.8 per cent, and in value of $3,947,505, or 60.5 per cent, as compared with 1902. The price per barrel rose from $0.872 in 1902 to $1.14 in 1903, a gain of 26.8 cents per barrel. This state produced 9.14 per cent of the total output of the United States in 1903, and 11.06 per cent of the total value, the value of the Indiana output being more than 3 per cent greater than the value of the product of either Texas or California.

The total number of wells drilled in 1903 was 3,693, of which number only 380 were dry holes and 3,313 were productive wells, the dry wells representing only 10.3 per cent in 1903, as compared with 15 per cent in 1902, and with 16 per cent in 1901. The average initial production of new wells per month in 1903 was 4,250 barrels, as compared with 3,772 barrels in 1902.

The increased production was well maintained throughout the state, and in numerous instances new pay streaks were found deeper in the Trenton limestone. One of the serious drawbacks connected with the operation of wells in this state is the immense quantity of salt water that it is necessary to pump to secure and maintain the production. In some localities 20 barrels of salt water are pumped for one barrel of petroleum produced. The economical and efficient natural gas engine enables this great expenditure of power to be applied at a reasonable expense.

Outside of the well developed areas of the Trenton limestone there are a few smaller pools in the state which have produced some petroleum, but nothing to compare in quantity to the original field. There are small producing areas in Jasper, Vigo and Dubois counties, in which the corniferous limestone is productive. In Gibson county several small wells were developed during the latter portion of the year near Princeton, which gave a production of from five to 15 barrels of heavy, dark petroleum from a formation corresponding to the lower salt sand or Maxon sand of West Virginia, but known as the Mansfield sand in Indiana, and resting upon the subcarboniferous limestone. All the well sections in this portion of southern Indiana show a very remarkable thinning out of the formation, as the distance from the bottom of the Mansfield sand or salt sand to the top of the corniferous limestone near the bottom of the Devonian is less than 550 feet, as compared with an interval of about 4,500 feet between the same horizons in western Pennsylvania.

ALABAMA.

A well was bored at Falkville, Morgan county, in 1902, and a black oil was struck at about 800 feet. The well was drilled to a depth of about 1,800 or 2,000 feet and plugged. At Hartsells, Morgan county, a well was being drilled at the close of 1903 with good indications, some oil and a considerable flow of gas having been struck. A well was being drilled in Limestone county, but no report could be obtained. Two very good gas wells were struck in 1903 and 1904 about one mile from Hazelgreen, Madison county, one with a pressure of 55 pounds and the other with a pressure of about 100 pounds. Prospecting for oil is being carried on in Escambia county. Near Mobile two small gas wells are flowing, but no oil has been found. In southern Alabama several holes have been bored without any indications of petroleum or natural gas.

FLORIDA.

A number of prospect holes have been drilled in the Pensacola section, but in none of them has oil been found. One well has been in process of drilling for nearly two years.

MISSISSIPPI.

At the close of 1903 a company was boring for oil in Clarke county, but at the present writing had not found petroleum or natural gas.

GENERAL GEOLOGICAL SECTION FOR SOUTHEASTERN OHIO AND WEST VIRGINIA



COAL MEASURE OIL GROUP

150′

300′

450′

600′

750′

900′

1050′

1200′

SUB-CARBONIFEROUS OIL GROUP

1350′

1500′

1650′

No. 8 Pittsburgh Coal.
Limestone.

Morgantown Sandstone.

Red Shale.

Crinoidal Limestone.

Red Shale.

Buffalo, 1st Cow Run Oil Sand.

Brush Creek Coal.

Cambridge Limestone and Flint.

Mahoning Sandstone.

No. 7 Upper Freeport Coal.

Freeport Sandstone.

No. 6 Kittanning Coal (Hocking Valley Seam).

No. 5 Coal.

"Dunkard" 2nd Cow Run Sand.

Macksburg 500′ Sand.

Coal.

Gray Shale.

No. 1 Coal.

Black Shale.

Macksburg 800 ft. Sand.

Black Shale.

No. 12 Conglomerate { White Oak 1st Sand, W. Va. / Burning Springs 800 ft. Sand. / Cairo Oil Sand, W. Va. / Maxon Sand, W. Va.

Sub-Carboniferous Limestone.

"Keener" Oil Sand. { Tyler County, W. Va.

"Big Injun" Oil Sand. { Tyler / Monongalia, Marion, and Ritchie Counties, W. Va.

"Squaw" Oil Sand. { McDonald, Penn'a. and Monroe County, O.

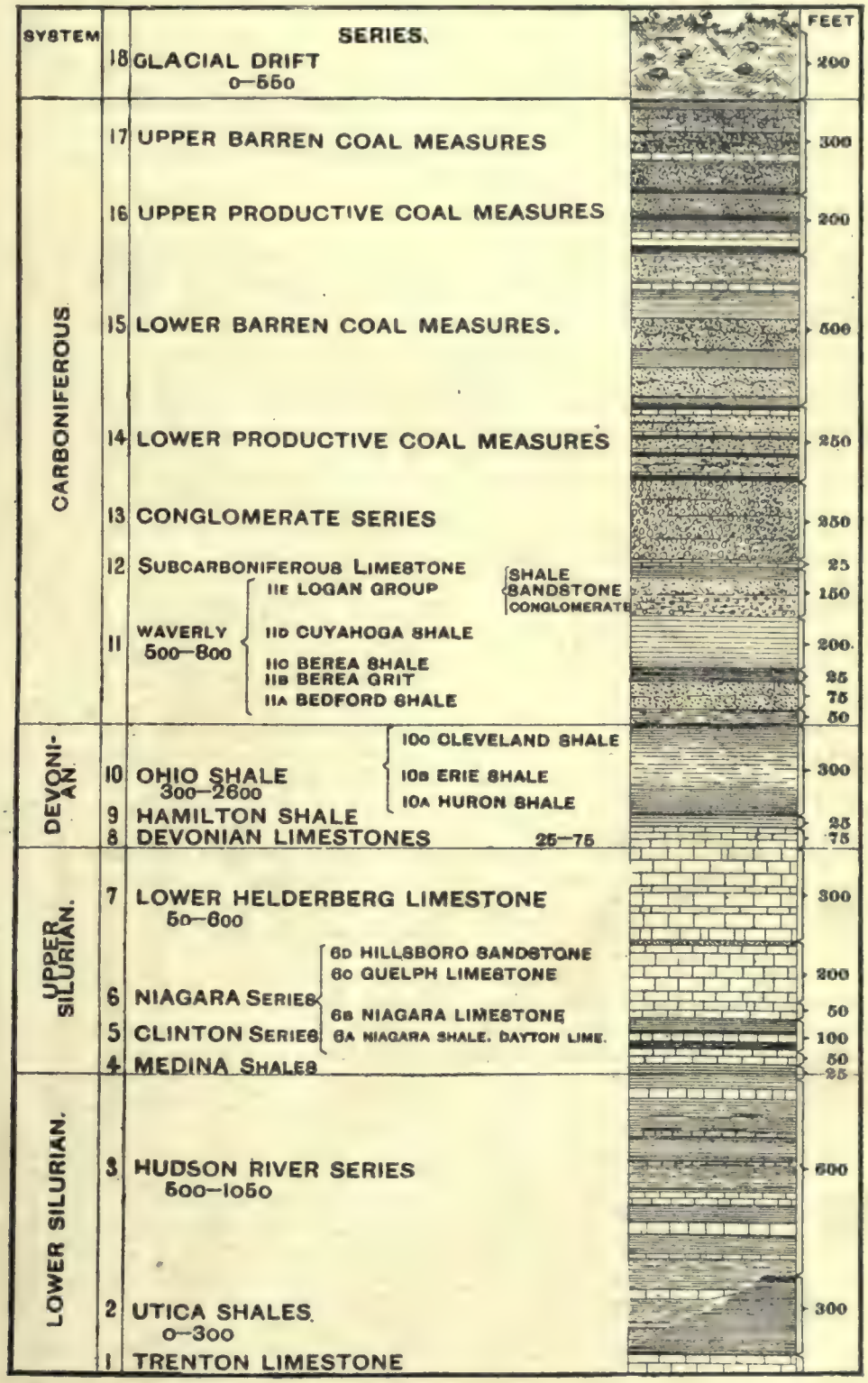
Cuyahoga Shale.

Black Shale.

"Berea" Oil Sand.

Bedford Shale. { Macksburg and Archer's Fork, Steubenville, Barnesville, Newcastle and Corning, O. White Oak, Eureka, and Belmont, W. Va.

GENERAL GEOLOGICAL SECTION FOR NORTHWESTERN OHIO AND INDIANA



WYOMING.

The only regular production of petroleum in this state is on Salt creek in the northeastern portion of Natrona county, where 11 wells supply a small refinery at Casper, 50 miles distant. The crude oil is hauled to this refinery in tank wagons and is there converted into a superior lubricating petroleum. The most active work in prospective territory during the year was at New Spring valley, Uinta county, where a number of wells were drilled to about 1,000 feet in depth, several of which would produce from 10 to 20 barrels of a very superior petroleum with a paraffin base and operations would be more active if a market could be secured. About 3,000 barrels are stored in tanks at this locality.

There are also several artificial pools containing from 4,000 to 5,000 barrels of heavy petroleum that has collected from wells in the Popo Agie district, south of Landin, Fremont county. There are several wells in this pool that will flow naturally a considerable amount of petroleum. There are a number of localities on the north flank of the Rattlesnake range where there are petroleum springs and an outcrop of massive sandstone impregnated with petroleum. During 1903 wells have been drilled in Bighorn, Converse, Crook, Natrona, Sweetwater, Uinta and Weston counties.

The chief difficulties that confront operators in this state are the want of a home market and the distance by rail to a market which would consume any large quantity of the product. Wyoming is well supplied with bituminous coal, which excludes petroleum from the market as a fuel. There was a considerable increase in the production at Salt creek during 1903, the price remaining at $7 a barrel.

COLORADO.

The production of crude petroleum in this state was considerably increased by the drilling of a number of deep wells in the southern portion of the old Florence field to a deeper strata. These wells range in depth from 2,850 feet to 3,600 feet. Four pay streaks have been developed by a number of these wells, although there are instances where a deep well failed to find any of them. The petroleum found in this district is probably in the same geological horizon as that of the Boulder field and lies in the Pierre group of the Montana cretaceous. The petroleum produced in the Florence district is of a dark green color, is of good quality, with a gravity of from 31 to 32 degrees Beaume. The depth of the wells in the Boulder field is between 2,700 and 2,850 feet. The quality of the petroleum is superior to any found west of the Mississippi river, and is of a specific gravity equal to 42 degrees Beaume.

The production of the Florence field in 1903 was 447,203 barrels, that of the Boulder field 36,722 barrels, a total of 483,925 barrels, the largest in the history of the state, and an increase over the production of 1902 of 87,024 barrels, or nearly 22 per cent. The value of the product of 1903 was $431,723, or 89.2 cents per barrel, as compared with $484,683, or $1.22 per barrel in 1902, a decrease of $52,960. The production of Colorado in 1903 was 0.48 per cent of the total production of the United States, and its value was 0.45 per cent of the total value.

The number of wells producing in the Florence field during 1903 was 70, that of the Boulder field nine, a total of 79. All the present production is refined at Florence.

There has been some prospecting in Pueblo, Archuleat, Rio Blanco and Routt counties, which has not yet resulted in securing petroleum in paying quantities. The geological conditions of the Boulder field were discussed in the report for 1902.

KANSAS.

The developments of petroleum in this state during 1903 has shown that, in addition to the area already known, an immense area of profitable territory exists in southeastern Kansas and extends over into Indian and Oklahoma territories. The physical conditions surrounding this field have proven to be very similar in many particulars to those of the original Pennsylvania field, except that the surface is more level. The petroleum is found in pools of greater or less extent, associated with natural gas over many square miles of area and not in concentrated pools containing from 200 to 250 acres, as is the case at Spindle Top and Sour Lake in Texas.

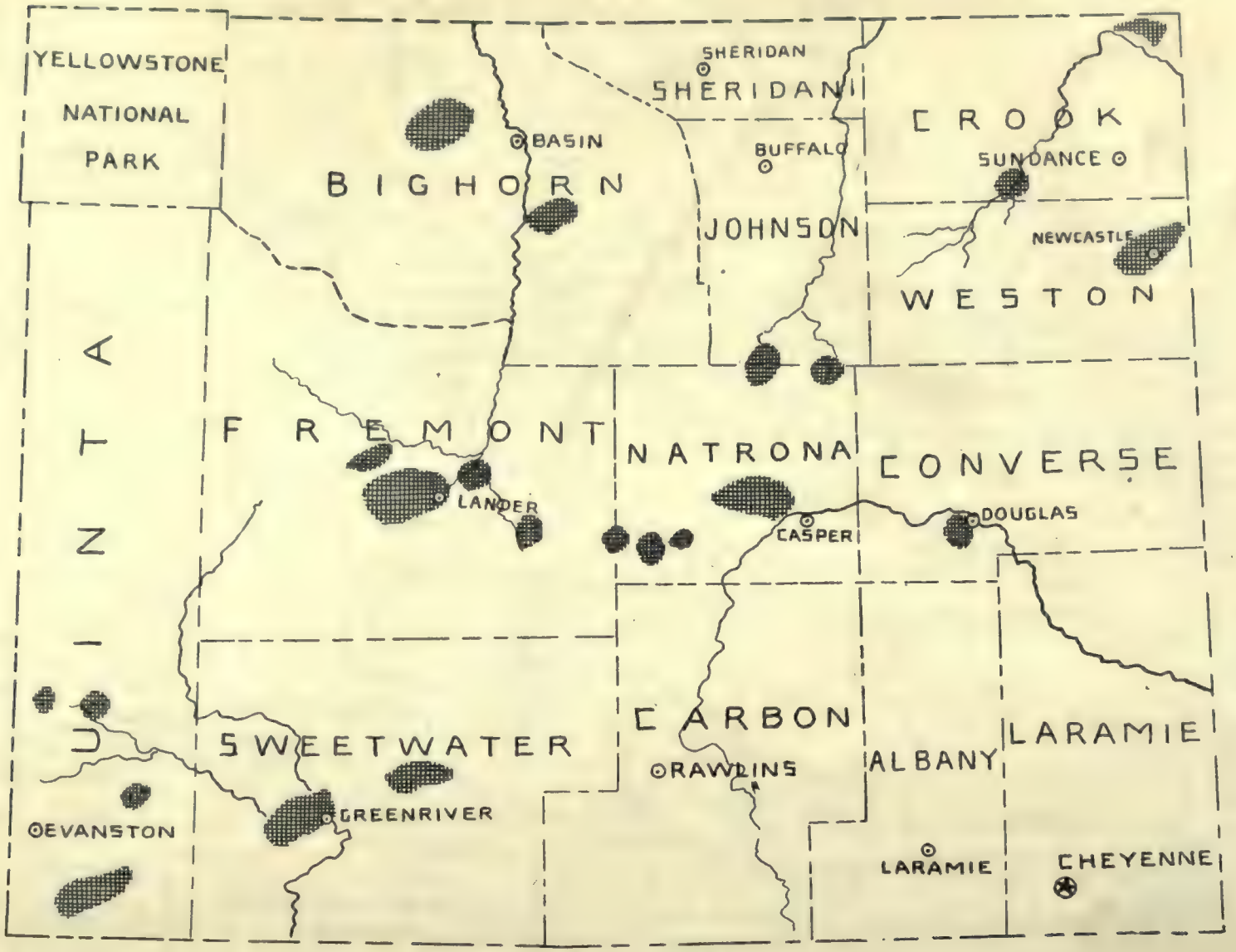
The quantity of petroleum produced would have been considerably larger had the pipe lines been in condition to handle it as they did during the last five months of the year. Shippers by rail to Noedesha were obliged to submit to a reduction of 23 cents per barrel, which in many cases was prohibitive. The production at the close of the year was about six times as great as it was at the beginning, which shows the wonderful increase.

Beginning with Humboldt, in Allen county, there seems to be an almost continuous pool to the southwest, passing through the counties of Neosho, Wilson, Montgomery and Chautauqua to the state line, where it joins that of Indian and Oklahoma territories, an area 65 miles in length, with an average width of 20 miles, although at some points the distance between develop local pools of petroleum and natural gas is much greater.

The production is from a sandstone formation, generally known as a "sugar sand," usually from 15 to 30 feet in thickness. The general dip is to the west and southwest. The wells in the northern portion of the pool in Allen county are about 700 feet in depth, and they increase in depth with the general trend of the development. The gravity and quality of the petroleum produced increase with the depth of the petroleum bearing sandstone. No very large flowing wells have been developed; but a large number of wells that produce from 10 to 50 barrels per day with remarkable regularity have been secured, which can be cheaply operated with natural gas.

There has been a great increase in the length of pipe lines and in the number of storage tanks completed

OUTLINE MAP OF WYOMING OIL FIELDS



EXPLANATION.

OIL FIELDS.

OUTLINE MAP OF COLORADO OIL FIELDS



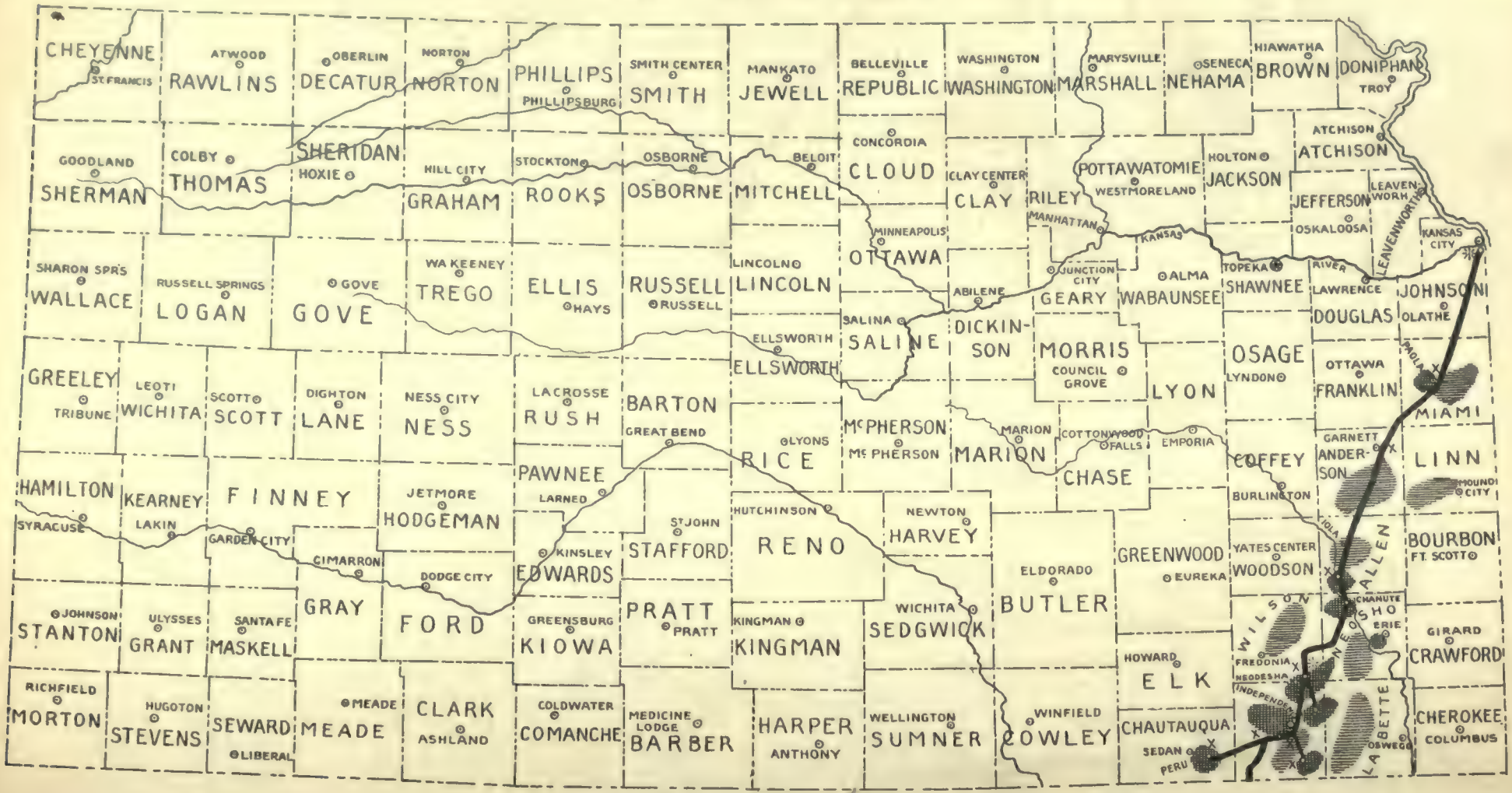
EXPLANATION

OIL FIELDS ✻ REFINERY

OUTLINE MAP OF

KANSAS

OIL AND GAS FIELDS



EXPLANATION

OIL FIELDS — NATURAL GAS FIELDS — PRAIRIE OIL AND GAS COS (STANDARD OIL CO) PIPE LINE TO KANSAS CITY, KAN.

during the latter part of the year, and nearly all of the pools have been connected by pipe line with the refinery at Neodesha, which has been greatly enlarged to take care of the increased production. A very large area has been leased by individuals and companies, and drilling has been most actively pushed. Fully 1,400 wells have been completed during the year, about four times as many as were completed during 1902. In no other locality in the petroleum fields has there been such activity as there was in Kansas and in Oklahoma and Indian territories during 1903. The quality of most of the petroleum produced in Kansas is equal, if not superior to that of the Lima-Indiana field, and the indications are that the year 1904 will witness a production of about 3,800,000 barrels from this section.

PRODUCTION IN KANSAS.

The production for 1903 was 932,214 barrels, as compared with 331,749 barrels in 1902, an increase of 600,465 barrels, or about 181 per cent. In rank of production Kansas was eighth, and produced 0.93 per cent of the total output of the United States; in 1902 Kansas was tenth in rank, and produced 0.38 per cent of the total for that year. When the value of the production is considered, Kansas occupied eighth place and produced 1.04 per cent of the total value in 1903, as compared with ninth place and 0.41 per cent of the total value in 1902.

The average price for the Kansas production in 1903 was $1.06 per barrel, as compared with 88 cents in 1902, a gain of 18 cents per barrel. The highest price obtained was for the oil produced at Independence, which averaged $1.30½ per barrel. The petroleum from the Chanute district, which produced over 60 per cent of the total, brought an average of 88⅞ cents per barrel. The lowest price paid was 60 cents per barrel for heavy petroleum produced in the Humboldt district.

INDIAN AND OKLAHOMA TERRITORIES.

The extension of the Kansas pool into Indian and Oklahoma territories has been known for a number of years, but owing to the complications in the law governing leases in both of these territories, comparatively little has been done in the way of development until during the year 1903. The developments so far have shown Indian territory to contain a very large area of petroleum, some of which is of superior quality, nearly equal to that of Pennsylvania. A number of flowing wells were drilled near Bartlesville and at other localities during 1903, which brought up the production by leaps and bounds, with the possibilities only just beginning to be realized. The present pipe line system connects Bartlesville with Neodesha, Kans. The total production in Indian territory in 1903 was 138,801 barrels, and 110 barrels were produced in Oklahoma, making a total of 138,911 barrels, which sold for $142,402, at an average price of $1.02½ per barrel. There was a gain of 101,811 barrels over the production of 1902, an increase of 274.42 per cent. At the close of the year there were about 110 wells producing, but many were shut in on account of the want of transportation. There were 10 wells drilling. The producing sand at Bartlesville lies about 1,250 feet below the surface.

The production in Oklahoma territory was only 110 barrels from three wells, which is probably the mere beginning of the operations in this territory. There is no doubt that much of the northeastern portion is underlaid by the same measures, more deeply buried, that are so productive in Indian territory and Kansas.

LOUISIANA.

The petroleum thus far produced in this state has been from wells in beds of loose sand saturated with petroleum. More or less difficulty has attended their successful operation. The development at Jennings and Welsh have long ago passed the experimental stage and have become regularly productive areas. Jennings is located 90 miles east of Beaumont, Texas, and 190 miles west of New Orleans. Welsh is some 12 miles west of Jennings.

The first well was opened in August, 1901, and tapped a loose bed of sand at 1,822 feet, which flowed spasmodically large quantities of sand and petroleum, accompanied with some natural gas. During the past year a number of producing wells have been added in both of these fields, accompanied by a number of dry holes. Some petroleum has also been developed in a well at Brearex bridge. The serious difficulty in most of the wells is to control the loose sand saturated with petroleum, which is often forced into the casing by gas pressure and shuts off the flow. No solid material is encountered in drilling. The formation consists of a series of clay, sand and gumbo.

There was an increase in the production during the year 1903 of 369,145 barrels, or 67.29 per cent as compared with 1902. The petroleum produced at Jennings is slightly lighter in gravity than that produced at Beaumont and carries less sulphur. It finds a market chiefly for fuel purposes, its value being about 19,840 B. T. U. More or less petroleum and natural gas have been developed at Calcasieu, Lake Charles, Cowley, Lafayette and Sulphur.

TEXAS.

The close of the year 1903 about completes the third year of the discovery of the remarkable deposit of petroleum at Spindle Top by the large flowing well drilled by Captain Lucas. Since then within a radius of 30 miles from Spindle Top there has been produced, including loss by fire and fuel consumption, not less than 40,000,000 barrels of crude petroleum. A large quantity has also been absorbed by earthen reservoirs.

Since 1896 there has been a considerable production of a remarkably pure crude petroleum at Corsicana, amounting to 401,817 barrels in 1903, but the wells are small, and there has been a gradual decline since its maximum of 829,560 barrels of production was reached in 1900. The oil has been refined at that locality.

The rapid development of the Sour Lake pool, the

OUTLINE MAP OF

OKLAHOMA AND INDIAN TERR'S

OIL AND GAS FIELDS



OUTLINE MAP OF
LOUISIANA
OIL FIELD.



EXPLANATION.

OIL FIELD.

increased production at Saratoga, the decline in the production of the original pool at Spindle Top and the opening of an entirely new pool known as Batsons Prairie, near the close of 1903, are among the important events of the industry in this state during the last year.

The chief market for the crude petroleum produced in this section of the state is its use for fuel. The greater portion was transported by water from Port Arthur and Sabine Pass, and another very considerable portion was distributed by railways in tank cars to points of consumption. A considerable quantity of refined products and residuum was also shipped to coastwise and foreign ports. The entire production of the state in 1903 was 17,955,572 barrels, a decline of only 128,068 barrels as compared with that of 1902. On the other hand, the value of the production in 1903 was $7,517,479 as compared with $3,998,097 in 1902, a gain of $3,519,382. In 1903 Texas ranked third in quantity of production, being credited with 17.87 per cent of the total, and fifth in value, being credited with 7.93 per cent of the total value of the domestic output.

The actual quantity of all the petroleum brought to the surface in the Spindle Top, Sour Lake, Saratoga and Batsons prairie pools in 1903 is estimated to be close to 19,000,000 barrels. If to this 500,000 barrels produced in Corsicana be added the grand total for Texas production in 1903 is 19,500,000 barrels in round numbers, made up as follows:

	Barrels.
Shipped by water	8,000,339
Shipped by rail	6,096,207
Shipped to storage tanks	3,352,518
Estimated loss by fire and seepage, and used for fuel	1,550,936
Total production at Spindle Top, Sour Lake, Saratoga and Batson	19,000,000
Production at Corsicana and Powell	500,000
Total production in Texas in 1903	19,500,000

EQUIPMENT AND DEVELOPMENT IN SOUTHEASTERN TEXAS.

There are at present completed and in operation in the southeastern Texas oil fields, not including Corsicana, 209 miles of 6-inch pipe line, 23 miles of 8-inch line, and 20 miles of 4-inch line—a total of 252 miles, exclusive of loops and connections, short lines to Beaumont from Spindle Top, and lines from the fields to the loading racks on the railroad lines. Adding to these several connections, there is a grand total of over 300 miles, representing an investment of approximately $2,000,000.

At the close of the year there were in the southeastern Texas fields, not including Corsicana, 19,226,800 barrels of tankage. This was divided as follows:

Steel tankage, 5,568,000 barrels; wooden tankage, 736,800 barrels; earthen tankage, 12,922,000 barrels. At the same time, by conservative estimate, there were distributed over the state, for the purpose of storing oil for the use of railroads, factories, etc., something over 2,000,000 barrels in steel and wooden tankage. In addition to this storage equipment, there were in operation on the railroads of Texas during the year over 1,500 tank cars, varying in capacity from the 300-barrel car of the Southern Pacific system to the 150-barrel and 160-barrel car of the private lines and distributing agents. These cars carried during the year about one-third of the total production of the fields to points in this state and Louisiana. Very little oil was shipped by rail elsewhere than to these two states. A considerable part of the oil so shipped was for the use of the railroad companies themselves as fuel for oil burning locomotives, one company having since 1901 equipped 212 locomotives with oil burners and tank tenders.

Since the discovery of the Spindle Top field there have been drilled in that and other fields in Texas over 1,200 wells. This does not include the many unproductive wells drilled outside the limits of the proven fields and in other parts of the state in search of new fields. Of the total number of wells drilled in these fields a number not exceeding 300 were in operation at the end of the year. The remaining 900 and more were inoperative from three principal causes:

1. Many were lost in the early development period through faulty drilling.
2. Many which at first were good producers eventually ceased to produce and were abandoned.
3. Many others had to be abandoned on account of salt water which made its appearance either during the drilling operations or after a few weeks of good oil production.

SPINDLE TOP POOL.

Prominent Events During 1903.

The original Spindle Top or Beaumont pool produced only one-half the quantity of petroleum in 1903 that it did in 1902. A very large portion of this quantity was secured by the slow method of pumping. During May an extension of the original lenticular pool containing less than 200 acres was secured to the northwest, a distance of about 1,000 feet, by the finding of a well which at first produced 5,000 barrels per day. However, this extension must have been very narrow, as only a few wells drilled in this new outlet proved of any value whatever, and the first well soon became choked with loose sand and was abandoned. In January of 1903 the entire production of this field was only about 25,000 barrels per day; during February it was increased to about 40,000 barrels per day from 110 wells in operation; but from this production there was a gradual decline and at the close of the year the quantity was reduced to about 13,000 barrels per day. There was a number of wells drilled during the year into the first or upper pay, found at from 750 to 800 feet, which secured a moderate production. The larger quantity produced in this field comes from an open, porous limestone at a depth


OUTLINE MAP OF
TEXAS
OIL & GAS FIELDS
DALLAM
SHERMAN
HANSFORD
OCHILTREE
LIPSCOMB
HARTLEY
MOORE
HUTCHINSON
ROBERTS
HEMPHILL
OLDHAM
POTTER
CARSON
GRAY
WHEELER
DEAF SMITH
RANDALL
ARMSTRONG
DONLEY
COLLINGSWORTH
PARMER
CASTRO
SWISHER
BRISCOE
HALL
CHILDRESS
BAILEY
LAMB
HALE
FLOYD
MOTLEY
COTTLE
HARDEMAN
FOARD
WILBARGER
WICHITA
RED RIVER
COCHRAN
HOCKLEY
LUBBOCK
CROSBY
DICKENS
KING
KNOX
BAYLOR
ARCHER
CLAY
MONTAGUE
COOKE
GRAYSON
FANNIN
LAMAR
RED RIVER
BOWIE
YOAKUM
TERRY
LYNN
GARZA
KENT
STONEWALL
HASKELL
THROCKMORTON
YOUNG
JACK
WISE
DENTON
COLLIN
HUNT
DELTA
HOPKINS
FRANKLIN
TITUS
MORRIS
CASS
CAMP
RAINS
WOOD
UPSHUR
MARION
GAINES
DAWSON
BORDEN
SCURRY
FISHER
JONES
SHACKELFORD
STEPHENS
PALO PINTO
PARKER
TARRANT
DALLAS
ROCKWALL
KAUFMAN
VAN ZANDT
SMITH
GREGG
HARRISON
ANDREWS
MARTIN
HOWARD
MITCHELL
NOLAN
TAYLOR
CALLAHAN
EASTLAND
ERATH
HOOD
JOHNSON
ELLIS
HENDERSON
RUSK
PANOLA
SABINE RIVER
EL PASO
LOVING
WINKLER
ECTOR
MIDLAND
GLASSCOCK
STERLING
COKE
RUNNELS
COLEMAN
BROWN
COMANCHE
BOSQUE
HILL
NAVARRO
ANDERSON
CHEROKEE
NACOGDOCHES
SHELBY
REEVES
WARD
CRANE
UPTON
TOM GREEN
IRION
CONCHO
MCCULLOCH
SAN SABA
HAMILTON
MILLS
CORYELL
McLENNAN
LIMESTONE
FREESTONE
HOUSTON
ANGELINA
SAN AUGUSTINE
LEON
FALLS
ROBERTSON
MADISON
TRINITY
PECOS
FORT STOCKTON
OZONA
SCHLEICHER
MENARD
MASON
LLANO
BURNET
WILLIAMSON
BELL
MILAM
BRAZOS
WALKER
SAM HOUSTON
POLK
TYLER
JEFF DAVIS
FORT DAVIS
CROCKETT
SUTTON
SONORA
KIMBLE
GILLESPIE
BLANCO
TRAVIS
AUSTIN
BURLESON
LEE
WASHINGTON
GRIMES
MONTGOMERY
LIBERTY
HARDIN
JEFFERSON
CHAMBERS
NEWTON
PRESIDIO
MARFA
ALPINE
BREWSTER
VAL VERDE
EDWARDS
ROCK SPRINGS
KERR
KENDALL
COMAL
HAYS
CALDWELL
GUADALUPE
BASTROP
FAYETTE
COLORADO
AUSTIN
WALLER
HARRIS
BEAUMONT
PORT ARTHUR
GALVESTON
MEXICO
DEL RIO
BANDERA
BEXAR
GONZALES
LAVACA
FORT BEND
GALVESTON
RIO GRANDE
KINNEY
UVALDE
MEDINA
WILSON
DEWITT
WHARTON
BRAZORIA
MAVERICK
ZAVALLA
FRIO
ATASCOSA
KARNES
VICTORIA
JACKSON
MATAGORDA
GOLIAD
CALHOUN
DIMMIT
LA SALLE
McMULLEN
LIVE OAK
BEE
REFUGIO
ARANSAS
WEBB
SAN PATRICIO
ENCINAL
DUVAL
NUECES
ZAPATA
STARR
HIDALGO
CAMERON
GULF OF MEXICO
EXPLANATION
OIL FIELDS.
NATURAL GAS FIELD.
1,2,3,4 ETC,... OIL REFINERIES.
....PIPE LINES

of about 1,050 feet. The upper pay is a loosely cemented sand from which in some instances shallow wells produced from 500 to 600 barrels a day. Many of the small operators became discouraged, sold out or leased their wells to the larger companies, and removed to Sour Lake and Batson prairie, and there took part in the development of the newer fields. The slow and more economical exhaustion of what remains is being carried on by the purchasers.

The majority of the productive wells during 1903 were those more recently completed. The most productive area is that portion of the field known as the Flats, just west of the original development. The presence of water in considerable quantity has seriously retarded production in many wells. The original well, which was drilled into the sand early in 1901, by Captain Lucas, and which flowed at the rate of 70,000 barrels per day for 10 days until capped, has long since ceased to be a producer.

On the 15th day of April, 1903, a serious fire broke out in this field, which destroyed a number of derricks, tanks and equipments, and also consumed several hundred thousand barrels of petroleum, involving a loss of about $440,000 to the operators. According to all the most reliable sources of information that were available, the production of the Beaumont or Spindle Top pool during 1903 was 8,600,905 barrels, as compared with 17,420,949 barrels in 1902. Besides the several immense loading racks where the petroleum is loaded into tank cars connected to the wells by pipe lines, there are two 6-inch lines connecting Spindle Top with Port Arthur, operated by the Guffey Petroleum Company, one 6-inch line operated by the National Oil and Pipe Company, and another 6-inch line operated by the Texas Company; there is also one 6-inch line connecting Spindle Top with Sabine Pass, operated by the Lone Star and Crescent Company, and another 6-inch line operated by the Security Oil Company.

SOUR LAKE.

This field was partly developed during 1902, and is located in Hardin county, 25 miles northwest of Spindle Top. During 1903 the area of productive territory was shown to be about 250 acres, and up to the close of 1903 about 450 wells had been completed, of which only 150 were productive. In their early life a number of these wells produced over 20,000 barrels per day. During the first two months of the year only six or seven wells were producing less than 1,000 barrels per day. Some of the original gushers opened during 1902 were abandoned early in 1903.

In May the real development of the Sour Lake pool began, and by the close of June 144 wells had been completed since the first of the year, the number of producing wells being 28. An area extending 3,800 feet north and south and 2,500 feet east and west had been proven to be profitable territory. On August first there were 75 producing wells; many others had been lost in drilling or abandoned as dry holes. The production at this time was estimated to be close to 80,000 barrels per day, which was far beyond the facilities for storing and transporting the product.

By the close of 1903 there were four 6-inch lines and one 8-inch line leading to Beaumont, a number of lines leading to the loading racks at the railroad. one 6-inch line to Saratoga, 10 miles distant, and one 4-inch line to Raywood station, on the Southern Pacific railroad.

The greatest production in this field was in August and September, when it averaged from 50,000 to 60,000 barrels per day, the decline being due to the falling off of the known areas of production. On what is known as the "Shoestring tract," so called on account of the land being divided up into long narrow strips, many wells were drilled within a few feet of each other until 150 had been completed. Many of these wells were originally good producers; but the closeness of the holes soon depleted the reservoir, which caused the abandonment of one-half, and left but 75 productive wells at the close of the year. In the southeastern portion of the field on the Davis tract over 100 wells were drilled during the year, not half of which were productive.

The early development of the Sour Lake field dates back to 1893, when six or seven wells were drilled to a depth of from 260 to 370 feet. Three of these wells produced a limited quantity of very dark and heavy petroleum of about 16 degrees Beaume. There was also some natural residuum found on the surface near where the first wells were drilled. A second sand was found at an average depth of 750 feet. Some of the wells on this horizon produced as much as 1,000 barrels per day. The third and fourth sands or pays are encountered at from 850 to 1,050 feet, respectively. The last named horizons were by far the most productive, and many of them produced as much as from 10,000 to 20,000 barrels per day when first opened up. One remarkable condition was developed especially in this field—the sand being found to be quite uniform in depth, but often locally irregular inside of short distances. In a number of instances where wells were only a few feet apart one well found a prolific pay streak, but the other failed to find any, although drilled many feet below the depth of the paying well.

The production of this district in 1903 is placed at about 8,700,000 barrels, which is slightly more than the production at Spindle Top for the same time. The quality of the petroleum is quite similar to that produced at the latter place, but it is slightly heavier in specific gravity.

The prices fluctuated considerably in 1903, the highest quotation being 60 cents per barrel in May; the lowest being 15 cents in August; and the average for the year being 30½ cents per barrel.

There was little regularity in the production of wells in close proximity; a few made notable records by their temporarily large output. The Sharp well produced 325,000 barrels in 20 days, valued at $80,000. Gilbert No. 1 produced enough petroleum in 30 days to bring $125,000. These were exceptional wells, however, and at the close of the year there were no flowing wells, all the production being secured by pumping.

OUTLINE MAP OF

INDIANA

OIL & NATURAL GAS FIELDS



Considerable difficulty was experienced in the winter months in freeing the heavy petroleum produced from water, as the pipe lines insist that only a small percentage of the latter must be delivered to them. To get rid of the water it was necessary to heat the petroleum in settling tanks. This was expensive and caused delay in transportation. The tankage in the Sour Lake district at the close of 1903 amounted to 3,155,000 barrels, distributed as follows:

Iron tankage, 1,555,000 barrels; wooden tankage, 200,000 barrels; earthen tankage, 1,400,000 barrels.

The most disastrous fire of the year in this field broke out on August 24, and destroyed several derricks and a large amount of equipment. However, only about 1,500 barrels of oil were consumed. A very serious effect of the fire was that, when the wells were repaired they refused to flow upon being reopened, and many of them were abandoned.

SARATOGA DISTRICT.

This pool is located 10 miles northwest of Sour Lake and 35 miles from Spindle Top. The area so far developed contains about 150 acres, upon which there are five wells pumping 2,225 barrels per day. The production for this year is estimated to be about 150,000 barrels, gravity 18 degrees Beaume.

Operations in this field began a number of years ago, when a spring-pole rig drilled to the depth of 100 feet and found a heavy black petroleum accompanied with some natural gas. Some years afterwards a shallow well drilled to the depth of 250 feet produced considerable petroleum. Not until after the remarkable development at Spindle Top were deeper wells drilled, which resulted in developing a pool. Hooks well No. 1 was drilled to 1,000 feet, when it flowed naturally and produced at first about 500 barrels per day. On May 1 Tell well No. 1 was drilled in and flowed at the rate of 500 barrels per day. In June there were 14 locations. In July the Rio Bravo Oil Company (Southern Pacific Railroad Company) drilled in a well near Hooks well No .1, which started off at 500 barrels per day. During the year three iron tanks, having a capacity of 130,000 barrels were completed, also wooden tankage to hold 4,000 barrels was completed.

Several large pockets of gas were encountered at a depth of 500 feet by a number of the wells, which for a time blew out in considerable quantity, accompanied by more or less sand and mud.

BATSON PRAIRIE DISTRICT.

On the last day of October, 1903, a flowing well was drilled in at the third entirely new field in southeastern Texas, Batson Prairie, Hardin county, eight miles west of Saratoga and 15 miles west of Sour Lake. Previous to this discovery a well was drilled in this locality by the Libby Oil Company, in the fall of 1901, which, at a depth of about 1,000 feet, encountered a small showing of petroleum followed by a large flow of hot salt water, when the well was abandoned without further test. This well is about three miles from that of the Paraffin Oil Company, which at a deptah of 790 feet in depth found a big flow of petroleum. Drilling was continued through about 35 feet of oil strata and the flow was natural.

The petroleum found in this district is different in character and gravity from that of Sour Lake and Spindle Top, having a gravity of between 23½ and 24 degrees Beaume. Just after the close of 1903 the Riley well south of the Paraffin Company's well found oil at a depth of about 1,150 feet, which flowed at the rate of 18,000 barrels per day. Previous to this a second well on the Paraffin Oil Company's property on the 19th day of December had a blow out of mud and sand which filled up the casing. After cleaning the hole of mud and water a solid stream of petroleum began to flow to the top of the derrick, which was controlled with difficulty. When opened this well produced 4,500 barrels per day. The petroleum produced by this well has a gravity of 29.9 degrees Beaume, the highest of any petroleum produced in southeastern Texas. On December 24, well No. 3 of the Paraffin Oil Company pierced the oil pay, which, like that found on Spindle Top, developed some salt water. When this was bailed off it started to flow at the rate of 15,000 barrels per day. By the close of the year 28 rigs had been built and operations were increasing daily. Only 4,500 barrels are reported as sold in this district during 1903 at 25 cents per barrel.

CORSICANA DISTRICT.

This pool is located at Corsicana, Navarro county, 200 miles northwest of Beaumont. Since 1897 it has had an annual average production of over 500,000 barrels of a superior grade of crude petroleum very different from that found elsewhere in the state.

The output has decreased about 47 per cent since 1901 and fewer wells have been drilled.

The greater portion of the petroleum comes from a depth of 1,010 to 1,040 feet in a loose grained quartz sand, in which foraminifera or microscopic fossils are found. This bed of sand ranges from 15 to 30 feet in thickness, and is capped by an almost continuous deposit of Ponderosa clay and marl. There are a few limestone concretions found near the surface. The original wells produced from 10 to 30 barbers per day when first opened up, and they are now producing about one-half of that quantity.

The area of the original field as now developed begins just southeast of Corsicana, near the old reservoir and extends in a general northern direction taking in a large portion of the town and extending almost north for four miles, with an average width of over one mile, the western boundary being very close to the line of the Southern Pacific railroad. This field is fully equipped with all the modern appliances, including gas engines in some instances, for producing petroleum in an economical manner.

During the early part of 1901 a field of heavy petroleum was developed five miles due east of Corsicana, and also at Powell, two miles farther east on the St. Louis, Arkansas and Texas railroad. Some of these wells that produced over 100 barrels per day


OUTLINE MAP OF
KENTUCKY
OIL AND GAS FIELDS
EXPLANATION
OIL FIELDS
NATURAL GAS FIELDS
ANTICLINAL OR UPLIFT FROM TENNESSEE TO OHIO
KENTUCKY PIPE LINE (STANDARD OIL CO'S) TO SEABOARD
X PUMP STATIONS ON PIPE LINE
OHIO RIVER
BIG SANDY RIVER
BOONE
KENTON
CAMPBELL
GRANT
PENDLETON
BRACKEN
MASON
LEWIS
GREENUP
CARTER
BOYD
HENRY
OWEN
HARRISON
NICHOLAS
FLEMING
OLDHAM
SHELBY
FRANKLIN
SCOTT
BOURBON
BATH
ROWAN
ELLIOTT
LAWRENCE
JEFFERSON
SPENCER
ANDERSON
FAYETTE
CLARK
MONTGOMERY
MORGAN
JOHNSON
MARTIN
BULLITT
NELSON
WASHINGTON
MERCER
JESSAMINE
MADISON
POWELL
WOLFE
MAGOFFIN
FLOYD
PIKE
MEADE
BRECKINRIDGE
HARDIN
GARRARD
BOYLE
LEE
ESTILL
BREATHITT
HENDERSON
DAVIESS
UNION
WEBSTER
HOPKINS
MUHLENBERG
OHIO
GRAYSON
LARUE
MARION
LINCOLN
ROCKCASTLE
JACKSON
KNOTT
CRITTENDEN
CALDWELL
LYON
TRIGG
CHRISTIAN
LOGAN
TODD
BUTLER
EDMONSON
HART
TAYLOR
CASEY
PERRY
LESLIE
LETCHER
BALLARD
MCCRACKEN
PADUCAH
BARDWELL
CARLISLE
MARSHALL
GRAVES
CALLOWAY
HICKMAN
FULTON
BENTON
MAYFIELD
PRINCETON
HOPKINSVILLE
ELKTON
RUSSELLVILLE
GREENSBURG
GREEN
ADAIR
RUSSELL
PULASKI
LAUREL
KNOX
HARLAN
WHITLEY
BELL
WARREN
BARREN
METCALFE
CUMBERLAND
CLINTON
WAYNE
MONROE
ALLEN
SIMPSON
SCOTTSVILLE
GLASGOW
BOWLING GREEN
LOUISVILLE
FRANKFORT
LEXINGTON
PARIS
WINCHESTER
RICHMOND
LONDON
MAYSVILLE
GREENUP
ASHLAND
HENDERSON
OWENSBORO
HARTFORD
HOPKINSVILLE
MADISONVILLE
PADUCAH
MAYFIELD
MURRAY
BENTON
CADIZ
ELIZABETHTOWN
HODGENSVILLE
LEBANON
SPRINGFIELD
DANVILLE
HARRODSBURG
MIDDLESBORO
PINEVILLE
WILLIAMSBURG
HAZARD
WHITESBURG
HYDEN
MANCHESTER
BEATTYVILLE
JACKSON
BOONEVILLE
OWSLEY
CAMPTON
SALTVILLE
PAINTSVILLE
GRAYSON
CATLETTSBURG
GREENUP
VANCEBURG
MAYSVILLE
BROOKSVILLE
FLEMINGSBURG
CARLISLE
MOREHEAD
OWINGSVILLE
MOUNTSTERLING
FRENCHBURG
WINCHESTER
GEORGETOWN
FRANKFORT
LAWRENCEBURG
TAYLORSVILLE
SHEPHERDSVILLE
BARDSTOWN
SPRINGFIELD
DANVILLE
HARRODSBURG
LANCASTER
STANFORD
MT VERNON
SOMERSET
JAMESTOWN
MONTICELLO
BURKESVILLE
ALBANY
SUNNYBROOK
TOMPKINSVILLE
SCOTTSVILLE
FRANKLIN
BOWLINGGREEN
GLASGOW
SIMPSONVILLE
RUSSELLVILLE
ELKTON
HOPKINSVILLE
CADIZ
EDDYVILLE
SMITHLAND
MARION
CALHOUN
HENDERSON
OWENSBORO
HAWESVILLE
HANCOCK
BRANDENBURG
LOUISVILLE
SHELBYVILLE
NEWCASTLE
OWENTON
WILLIAMSTOWN
CAMPBELL
BURLINGTON
GALLATIN
CARROLL
TRIMBLE
GRANGEVILLE
OLDHAM
LOUISA
GREENUP
GRAYSON
CATLETTSBURG
BOYD
MAYSVILLE
VANCEBURG
BROOKSVILLE
FLEMINGSBURG
CARLISLE
MOREHEAD
OWINGSVILLE
MOUNTSTERLING
FRENCHBURG
WINCHESTER
GEORGETOWN
FRANKFORT
LAWRENCEBURG
TAYLORSVILLE
SHEPHERDSVILLE
BARDSTOWN
SPRINGFIELD
DANVILLE
HARRODSBURG
LANCASTER
STANFORD
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BURKESVILLE
ALBANY
SUNNYBROOK
TOMPKINSVILLE
SCOTTSVILLE
FRANKLIN
BOWLINGGREEN
GLASGOW
SIMPSONVILLE
RUSSELLVILLE
ELKTON
HOPKINSVILLE
CADIZ
EDDYVILLE
SMITHLAND
MARION
CALHOUN
HENDERSON
OWENSBORO
HAWESVILLE
HANCOCK
BRANDENBURG
LOUISVILLE
SHELBYVILLE
NEWCASTLE
OWENTON
WILLIAMSTOWN
CAMPBELL
BURLINGTON
GALLATIN
CARROLL
TRIMBLE
GRANGEVILLE
OLDHAM

when first opened are now producing only from three to eight barrels per day.

The production in 1903 showed a considerable decline in the production of the lighter grade and a considerable increase in the heavier grade produced near Powell station.

BEXAR COUNTY DISTRICT.

Only a small quantity of heavy petroleum was produced in this pool in 1902. It came from wells 600 to 800 feet in depth near San Antonio and supplied a small local demand.

NACOGDOCHES COUNTY DISTRICT.

Numerous shallow wells were drilled prior to 1895 near Oil Springs in Nacogdoches county, some 12 miles southeast of the town of Nacogdoches. There has been a considerable outlay in drilling wells, establishing receiving tanks and building a pipe line, all of which has been practically abandoned. Only a very limited quantity supplying a local demand is now marketed.

NEW MEXICO.

The following is a summary of the report to the secretary of the interior by the governor of New Mexico:

Colfax county.—Indications of petroleum are found in the vicinity of Raton and a well is being drilled. Three wells have been drilled to the south of Raton and Chico Rico Mesas. Two were lost by caving, one reaching a depth of 2,640 feet. A third hole in process of drilling has reached a depth of over 1,700 feet. Some petroleum and natural gas have been found.

The entire plain is said to be underlaid with drab colored shales belonging to the Montana and Colorado cretaceous groups. The sands which should carry the petroleum are buried deep. Dikes of basalt where exposed to the surface are in localities impregnated with a dark green petroleum. Natural gas has been encountered in digging wells. Surface indications of petroleum are also found six miles southeast of Springer. In San Juan county there are numerous surface indications of petroleum, and several wells have been started, but as yet nothing has been developed in the way of a producing well.

McKinley county. In the western portion of this county there are surface indications of petroleum, and a well is drilling at Manuelito, but without practical results so far as tested.

UTAH.

Ozcerote, elaterite and other varieties of hydrocarbons, oil shales, natural gas and petroleum in limited quantities are known to exist in Utah. Large deposits of semi-liquid asphalt are reported to be found covering a portion of the bottom of Salt Lake, and arrangements are being made by men of large experience to drill a deep well at some locality along its shores in the near future.

MONTANA.

A number of petroleum springs or seeps are known to exist in two localities in Montana. One of these localities is near the Canadian boundary separating Montana from Alberta, east of the Flathead river, in Flathead and Teton counties. The recent strike reported to the north of this section, in Alberta, on the waters of the Kootenai river, has added additional interest to this section.

The other sections of this state in which numerous seeps are known to exist are in southern central Montana in the counties of Sweetgrass and Carbon. The latter county adjoins Wyoming. Three wells have been recently completed, but without practical results, in Carbon county, north of the foothills of Bear Tooth mountains, where the formations exposed are a series of sandstones and shales.

CALIFORNIA.

The most important event connected with the output of petroleum in the United States in 1903 was the remarkable increase in the production of California and its sudden elevation to the head of the states producing petroleum, superseding Ohio, which for several years previous ranked first. When values are compared, however, California's rank is sixth, being slightly less than that of Texas. During 1903 the state produced 24.27 per cent of the production and 7.81 per cent of the value of the petroleum produced in the United States. The total state production was 24,382,472 barrels in 1903, an increase of 10,398,204 barrels, or 74.36 per cent over that of 1902. The value of the petroleum produced was $7,399,439, an average of 30.3 cents per barrel, as compared with 34.8 cents per barrel in 1902.

The greater portion of the increase in 1903 came from Kern county, which, almost doubling its former large output, produced over 74 per cent of the total. The largest percentage of gain was in Fresno county, which increased 374 per cent over the production of 1902. The average price paid for the petroleum produced in Kern county in 1903 was 21 cents per barrel and 33 cents for that produced in Fresno county. The highest price paid was for a limited production from Santa Clara county, valued at $1.91½ per barrel.

FIELD OPERATIONS.

There was a total of about 480 wells completed during 1903, of which number about 125 were dry holes. Of the 16 counties in this state in which wells were drilled by far the greatest number were drilled in Kern county. So far profitable developments have been confined almost entirely to the Coast range, on the western side, and to the southern end of the great central San Joaquin valley.

Operations were conducted in the counties of Kern, Fresno, Los Angeles, Orange, Ventura, Santa Bar-


OUTLINE MAP OF
CALIFORNIA
OIL FIELDS
DEL NORTE
CRESCENT CITY
SISKIYOU
YREKA
MODOC
ALTURAS
HUMBOLDT
EUREKA
TRINITY
WEAVERVILLE
SHASTA
REDDING
LASSEN
SUSANVILLE
TEHAMA
REDBLUFF
PLUMAS
QUINCY
MENDOCINO
UKIAH
GLENN
WILLOW
BUTTE
ENTERPRISE
LAKE
LAKEPORT
COLUSA
SUTTER
YUBA
MARYSVILLE
NEVADA CITY
DOWNIEVILLE
SIERRA
NEVADA
PLACER
AUBURN
SONOMA
SANTA ROSA
NAPA
YOLO
WOODLAND
SACRAMENTO
PLACER V.
ELDORADO
MARIN
SAN RAFAEL
POINT RICHMOND
SAN FRANCISCO
SOLANO
FAIRFIELD
AMADOR
JACKSON
CALAVERAS
ALPINE
MARKLEVILLE
CONTRA COSTA
OAKLAND
ALAMEDA
SAN JOAQUIN
STOCKTON
SAN ANDREAS
SONORA
TUOLUMNE
BRIDGEPORT
MONO
SAN JOSE
SANTA CLARA
SAN MATEO
SANTA CRUZ
STANISLAUS
MODESTO
MERCED
MARIPOSA
MADERA
FRESNO
INDEPENDENCE
INYO
HOLLISTER
SALINAS
SAN BENITO
MONTEREY
KINGS
VISTALIA
TULARE
BAKERSFIELD
KERN
SAN LUIS OBISPO
SANTA BARBARA
VENTURA
LOS ANGELES
SAN BERNARDINO
RIVERSIDE
ORANGE
SAN DIEGO
PACIFIC OCEAN
EXPLANATION
OIL FIELDS
REFINERY
PACIFIC COAST OIL CO. STANDARD OIL PIPE LINE
X PUMP STATIONS ON PIPE LINE.

bara, Santa Clara, San Mateo, Monterey, Kings, Madera, Contra Costa, Colusa, San Bernardino and Humboldt. No new pools were opened, most of the operations for the year being confined to known localities as the increased facilities for transportation enabled much new work to be prosecuted.

KERN COUNTY.

The Bakersfield, McKittrick and Sunset fields, located in this county, were the scene of much active work during 1903, which resulted in the production of 18,077,900 barrels. The loose sand in which the deposit is found in this field is remarkably regular and often of great thickness, and the wells are also remarkably regular in their output, and range from 900 to 1,000 feet in depth. There must be considerable gas pressure to cause so heavy an oil as is found to flow naturally. The Bakersfield pool is by far the most important and there is good reason to infer that this pool will continue to produce still greater quantities of this quality of petroleum in the future. The southern terminus of the pipe line leading to Port Richmond is located at this field, and there is an immense quantity of petroleum, amounting to 3,500,000 barrels, stored in iron tanks in this vicinity.

FRESNO COUNTY.

The production in this county, so far, comes from what is known as the Coalinga field, in the southern portion of the county. Recently there was an extension of the oil field to the southwest. There was a remarkable increase in the production secured in this pool during 1903, which amounted to 1,560,129 barrels, or 374 per cent over that of 1902.

There are a number of grades of petroleum produced in this field, which range from 11 to 45 degrees Beaume. The greater portion has a gravity of about 33 degrees Beaume, but strange as it may seem the lighter grades are nearest the surface. Since 1897 this field has had from five to seven miles of pipe line in operation to receiving tanks on the Southern Pacific railway, near Coalinga. The Pacific Coast Oil Company has connected the Coalinga field with Mendota station by 31 miles of pipe line. This station is on the main line from Bakersfield to Point Richmond, and 166 miles south of the last named locality. One of the serious drawbacks at Coalinga is the scarcity of water, which is supplied to the drilling and pumping wells by a pipe line from wells several miles distant.

LOS ANGELES COUNTY.

The Los Angeles pool was quite active during 1903, and increased its production by the careful working of the original wells from 1,938,114 barrels in 1902 to 2,087,627 barrels in 1903. There was an average of 1,150 producing wells pumped during the year. Nearly the entire production was marketed as fuel petroleum. The Whittier pool in the southeastern portion of this county reaches over into Orange county and is known as the Fullerton pool. There are a number of deep wells in this pool that produce a large quantity of superior petroleum susceptible of refining in a profitable way. Other wells toward Brea Canyon produce large quantities of dark and heavy fuel petroleum.

At Newhall nothing new was developed during 1903. The older wells have been operated regularly and a few new producers added inside of the developed territory. In this pool a very light variety of petroleum was found several years previous, which was almost colorless and had a specific gravity of 50 degrees Beaume.

SANTA BARBARA COUNTY.

In Santa Barbara county the Union and the Pinal Oil Companies each secured a large flowing well during 1903, with indications of the existence of a large petroleum deposit at both localities.

Ventura and San Mateo counties had some slight fluctuations in their production. There is a slight production for the first time recorded in Santa Clara county.

TRANSPORTATION.

One of the most important events of the year bearing upon the petroleum industry in California was the successful operating of the pipe line built by the Pacific Coast Oil Company and extending from Bakersfield to Point Richmond, a distance of 278 miles, with a branch line of 31 miles from Mendota to Coalinga.

The successful handling of petroleum produced in Kern county, the southern terminal, with a gravity averaging 15½ degrees Beaume, was an entirely new departure in the transporting of liquids in pipes. This was brought about principally by the heating of the fluid by the exhaust steam and the covering of the line with a nonconductor; it was assisted also somewhat by the admixture of the lighter crudes developed at Coalinga, and in some instances by using a percentage of water.

The pipe line is now delivering from 20,000 to 25,000 barrels per day.

REFINERIES.

There are about 40 refineries in California, although many of them can hardly be classed as such, as they are designed more particularly to reduce the asphalt to a more compact form suitable for roadways. This is done by crudely distilling the heavier natural petroleum, from which 35 to 40 per cent of solid asphalt is secured. By far the most important refinery in the state was in process of erection during 1903 at Point Richmond, on the waters of San Francisco bay, connected with the Santa Fe railroad. This refinery is one of the largest, and is destined to have a most important influence by refining the crude petroleum of California for distribution on the Pacific coast, and to the Hawaiian islands, Japan, China and India by tank steamers as a grade of petroleum that can be sold

at reduced rates to the great masses of humanity who inhabit those portions of the globe. A large proportion of California petroleum must continue to be disposed of as fuel.

PETROLEUM FUEL.

The successful introduction of petroleum fuel on the Pacific coast has caused the rapid decline in the importation of coal. The problem of cheap fuel has been solved. The railroads, the manufacturers and the steamship lines are being directly benefited by its general introduction as an economical and perfect fuel.

Petroleum that is to be consumed inside of buildings or in steam vessels should not contain any of the lighter products, which are in many cases found in the heavier crude. It should have a fire test ranging from 220 to 270 degrees F. Under these conditions it is safe to handle and there is no loss from evaporation.

Numerous tests have shown that where the petroleum fuel is sold by measure the heavier grades have as high an evaporative test as the lighter ones; when sold by weight the lighter crudes usually have a higher evaporative value.

The important condition necessary is good combustion, and to insure that the liquid fuel should be completely atomized by a steam jet or by compressed air. The latter is preferable, especially when superheated, because it more easily produces complete combustion and does not carry off so large a quantity of heat. To insure satisfactory results it is also necessary in all cases to have the jet of liquid fuel spray upon hot fire bricks and not come in direct contact with the plates of the boiler until combustion has been completed.

The best results have been secured by building an arch of fire brick over the grate bars, the crown of which comes within five or six inches of the bottom of the boiler and is parallel to it. About every fourth brick in this arch should be left out for openings through which the products of combustion may escape. Inside of this arch a loose checkerwork of fire brick should be placed, upon which the petroleum should spray, only the necessary air being admitted through the openings in the grate bars. This can easily be regulated by the arrangement of the fire brick upon the bars.

In like manner the fire boxes of locomotives which use petroleum for fuel mus tbe arched with fire brick above where the spray strikes the back of the box, which must also be protected by fire brick, and an inverted arch of the same material should extend down into the ashpan, with open spaces in the brick work and an open space at the front end for the admission of the air.

HISTORY OF NATURAL GAS

Natural Gas Wells in Pennsylvania, Ohio, New York, Kentucky and Other States

Carburetted hydrogen is the chief component of the gas which escapes from the earth in wells and springs in many localities. It is evolved in the working of coal mines, and constitutes "fire damp." It is also a constant associate of petroleum and always issues in greater or less quantities from oil wells. It is given off, too, in the decomposition of recent vegetable matter, and may be seen bubbling up through the water of all pools in which plants are decaying. When it escapes from the earth it may be generally traced to beds of bituminous matter, such as coal, lignite, carbonaceous shale, oil ,etc. From these substances it may be obtained by artificial distillation, and evolved by the spontaneous decomposition which all organic substances suffer in decomposition.

As carburetted hydrogen produces a brilliant light in combustion, it is largely manufactured and used for the illumination of cities and residences. So extensively is it employed for this purpose that it may be regarded as an indispensable element in our modern civilization. It is not strange, then, that efforts have been made to utilize the immense quantities of gas which flow from wells and springs in so many different countries. The Chinese have for hundreds of years used for lighting and heating the gas which emanates from the earth in several provinces of their country. In the United States the gas which issues from the salt wells of the Kanawha valley for many years was employed as a fuel in the evaporation of the brine.

Of course the oil wells of Pennsylvania produce gas, and often in very great abundance, and it occasionally occurs that wells drilled for the purpose of obtaining oil produced gas only. On newly developed territory the sight to be witnessed at night in the many illuminations from this natural gas is truly grand, causing the heavens to be lighted up, and the earth to be spread abroad with a brightness equal to the best artificial illumination of any modern city.

The village of Fredonia, in western New York, had for more than 40 years been fully or partially lighted by gas which issued from springs at that place. In drilling for oil in the various oil districts of the western states, the gas which has been produced so abundantly was regarded as a useless, frequently inconvenient and dangerous product, in the early days, but in late years, however, this gas has been utilized in numerous localities and thousands of wells have been drilled for the express purpose of obtaining it. In some cases these gas wells have been highly productive, furnishing an abundance of material for heating and lighting in its most convenient and manageable form, so that this deserves to be reckoned as one of the important elements in the mineral resources of our country. As this method of procuring carburetted hydrogen gas forms a new industry, and one which will probably assume considerable importance, a few words in reference to its present condtiion and prospects may not be without interest to the public. I therefore ex-extract from my notes a few facts in regard to some of the most interesting of our gas producing districts. On the upper Cumberland, in Kentucky, gas accumulated in such quantities beneath the sheets of lower Silurian limestone that many hundred tons of rock and earth were blown out with great violence. These explosions received the local name of gas volcanoes. In Ohio gas escapes from nearly all the wells drilled for oil in the oil producing districts. Of these two drilled by Peter Neff, Esq., near Kenyon college, in Knox county presented some remarkable features. These wells were drilled in 1866, at the same geological horizon as that which furnishes the oil in Oil Creek, Pa. At the depth of about 600 feet, in each well a fissure was struck from which gas issued in such volume as to throw out the drilling tools and form a jet of water more than 100 feet in height. One of these wells was tubed so as to exclude the water, and the gas escaped from it in such quantity as to produce as it rushed through a two and a half inch pipe a sound that was heard a considerable distance. When ignited the gas formed a jet of flame three feet in diameter and 15 feet long. The other well was never tubed.

At West Bloomfield, N. Y., is another gas well not unlike those described. This is drilled to the depth of 500 feet, reaching down to the vicinity of the Marcellus bituminous shales. From some measurements made by Professor Wurtz, it appears that about 15 cubic feet of gas escaped from this well every second. It was proposed to utilize it through pipes to Rochester, a distance of 20 miles.

At Erie, Pa., there were 25 wells in successful operation, most of which were drilled for the special purpose of obtaining gas.

First.—H. Jarecki & Co. (Petroleum Brass Works) had two wells; the first drilled for oil in 1854, 1,200 feet deep. No oil was obtained, but brackish water and an abundant supply of gas.

At Conneaut and Painesville, Ohio, wells have been

drilled for gas with entire success, and others are being drilled in these localities, and at many points farther west.

Of two of the Painesville wells a few notes may be of interest to the residents of the lake shore. First, is the well of Gen. Casement on the east side of the town. This well is 700 feet deep and passed through the following materials:

One.—Drift, clay and gravel, 40 feet.

Two.—Erie shale, soapstone rock, 648 feet.

Three.—Huron shale, very black and bituminous, with strong smell of oil, 12 feet.

Gas was found in the Erie shale. The supply is abundant and is used for all domestic purposes in Gen. Casement's house. The pressure of the gas was tried, but at 27 pounds per square inch part of the apparatus failed.

Second.—Well at Erie Seminary, 725 feet deep at the time of observation. Strata passed through:

One—Clay and sand, 23 feet.

Two—Erie shale, alternations of sandy and argillaceous gray and green shales, 687 feet.

Three—Huron shale, black and bituminous, 15 feet.

The gas was found in the fissures or crevices of the soapstone rock. In the seminary well four such fissures were found. The first gas was obtained at 300 feet.

Another well at the seminary is of similar character. The supply of gas from both wells is sufficient to light and heat the building. If collected in a gasometer it would at least supply all the light required.

In the vicinity of Cleveland, as in many other localities in the eastern half of the state, gas and oil are frequently met with, and many wells have been drilled for one or the other of these useful articles.. Here, as elsewhere, there are two marked lines of gas and oil springs, conncted with the outcrops of the two sheets of bituminous shale which underlie the surface. First the Cleveland shale of lower carboniferous age, which crops out along the base of the hills that bound the Cuyahoga valley. This bituminous shale is from 30 to 60 feet in thickness and is the source of the oil of the East Cleveland and Kingsbury quarries, the noted gas spring at the brick yard beyond East Cleveland, etc. The oil of Mecca and Liverpool is derived from the Cleveland shale. Second, the Huron or Great Black shale, which passes beneath Cleveland and rising westward comes to the surface in Huron and Erie counties and forms a broad belt of outcrop, thence to the Ohio river. The Huron shale has a thickness of 300 to 400 feet, mostly black and highly bituminous, and is the source from which the gas of the Neff wells and the well on the lake shore, and the oil of Oil Creek are derived. In the valley of the Cuyahoga, in Cuyahoga and Summit counties, a large number of wells were drilled for oil some years ago. Most of these yielded both gas and oil, but neither in large quantity. From a similar well in the valley of Rocky river a copious flow of gas has continued to escape for several years. Of the wells recently drilled in this vicinity a brief notice may perhaps be of interest to the people of Cleveland. First, well at mouth of Kingsbury run, drilled by the Standard Oil Company for water. The depth of this well is 1,005 feet. The well is about ten feet above the run. Before reaching the rock, 238 feet of clay with partings of sand and gravel were passed through. The rock penetrated was gray and black shale. Some water and gas flowed from this well, but neither in large quantity.

Second, well drilled by the gas company, at the gas works near the mouth of the river, well head about 15 feet above the lake. This well is 835 feet deep. The rock was reached at 116 feet, the overlaying material being mainly blue clay, with sheets of quicksand and gravel. The rock passed through consisted of alternations of gray and black shale. Gas was obtained at several points, but not in remunerative quantity.

Third, well drilled by Captain Spaulding between Cleveland and Rocky river. This well began about 100 feet above the lake. At the depth of 715 feet it passed through—

1. Sand and clay, 12 feet.

2. Erie shale, gray argillaceous shale, with bands of sandstone, 400 feet.

3. Black shale with thinner bands of gray Huron shale, 303 feet. In this well gas was obtained at several horizons and the quantity was sufficient to light a number of houses.

In the city of Erie there were some 30 gas wells. These wells were for the most part drilled to a depth of from 500 to 700 feet. The shale is here reached at the depth of from 30 to 40 feet, and extends below any depth yet reached by the drill and is composed of alternate gray and black layers or veins—the gas being found only in the latter. The gas from a portion of the wells here furnishes fuel to three steam flour mills, the city water works, an oil refinery, two machine shops, a car manufactory and four or five other steam works. The City Gas Company also have a well and use a mixture of natural and manufactured gas for the use of the city.

At Buffalo, N. Y., a well was drilled to a depth of 640 feet, when a large vein of gas was struck. The volume of uprising gas showed a pressure of 130 pounds to the inch. This gas was soon exhausted.

HISTORY OF NATURAL GAS.

REMARKABLE GAS WELL AT FAIRVIEW, PA.

In June, 1872, a well was drilled about two miles from Fairview, Butler county, Pa., to a depth of 1,335 feet for oil, and was abandoned on account of the strong flow of gas and salt water; so great was the flow of gas that the boiler had to be removed to a distance of 25 rods. After the well was abandoned some two months the pressure of gas became so strong that it forced the water entirely out of the hole, and in the autumn of the same year a company was formed to utilize the gas, which was done by bringing it through a 3¼-inch casing to Fairview, and thence to Petrolia, three miles from Fairview. The gas is used

to light the streets and heat residences and offices in both places. The pressure, as indicated on a steam gauge, is 80 pounds. This well has an escape through a 6-inch pipe and the noise of the escaping gas can be heard readily for a distance of two miles.

A correspondent of the Titusville Herald under date of September 3, 1873, gives the following graphic account of this remarkable gas well:

The roar of the escaping fluid was equal to the sound of Niagara, and the iron tools that had penetrated 1,335 feet of solid rock were raised and tossed in the hole with as much ease as a skiff is rocked upon the surface of an angry ocean; so strong was the gas giant that one man might have helped the tools out of the well without the aid of an engine. A man might throw a one hundred pound rock into the escaping column and it would be thrown with ease to a height of 40 or 50 feet in the air; an ordinary club might be launched into the upward stream and it would be toyed with as a fountain jet toys with a marble. It would raise a club 75 or 80 feet in the air and when it would begin to descend it would be elevated again until it would escape the center of the current and then return to the ground. The voice of this giant can be heard for five miles distinctly, and it sounds like the approach of a train of cars on the railroad, or like the sound of a brake when letting down tools into a 1,500 foot well. In the hole is a little salt water, just enough to make the gas appear like blue smoke. The water, under the force of the gas, is formed into a mist and on approaching the well appears like a column of smoke rushing out of the valley, but woe be unto him who touches a match in this giant's face, for his breath is explosive and would when lit make heat enough to melt iron.

"For a few weeks this well blew, and howled, and whistled, making night hideous and day tedious with its ceaseless yells, until the arms of science opened to receive the wasting fuel. A 20 horse power boiler was stationed near the well and connected to receive it; to the boiler was connected a 3½-inch tubing, which was laid seven miles to Fairview, Petrolia, Karns City, and Argyle. To this seven miles of pipe are attached 40 pumping and drilling wells, eight pump stations and different pipe lines, 200 gas burners and 40 cook stoves, all of which burn the gas from this well. But they do not use it all. The well is only a 5½-inch hole, but the waste pipe is a 5⅝-inch casing, which fairly rings with the pressure of the escaping waste gas."

NEWTON GAS WELL NEAR TITUSVILLE, PA.

Nearly all wells producing oil yield small amounts of gas, which is often found in large enough quantities to make it available as fuel for boiler fires; but wells producing large quantities of gas unaccompanied by oil are comparatively rare. I have instances a few in different parts of the country, and would here make mention of one quite famous well of this sort, at the mouth of East Sandy creek, hereafter described, and another at Stewart's run, both in the Pennsylvania oil region. But the most remarkable gas well yet discovered is the Newton well on the A. H. Nelson farm, 5¼ miles northeast of Titusville. The well is the second one drilled in this vicinity—the first sunk in the fall of 1871, proved a dry hole. The usual strata of rock found in this region were passed through in drilling and there was no indication of oil, and but slight sights of gas during the process of drilling.

This well is drilled to the depth of 786 feet and was finished on the 11th of May, 1872. A few minutes after the pump was set in motion the flow of gas commenced throwing up the fluid as fast as a 2½-inch outlet would allow it. Soon the water was exhausted and the gas rushed out with a deafening noise and with terrible force. The well was at this time tubed only to the second sand rock, a depth of 705 feet. The casing was now lowered below the second and the tubing to the third sand rock, and pumping resumed, with about the same pressure from the third sand rock as from the second, but showing a difference in the quality of the gas, it being much purer and of higher illuminating power. On the 24th of June the casing was removed and placed above the first sand rock, leaving all the gas veins open below the casing. A sand pump was then run down a few times for the purpose of exhausting the water, and agitating the well so as to permit the gas to flow more freely. On putting down the sand pump for the fourth time the gas again rushed up, carrying the sand pump and line with it faster than steam power could be made to draw it out; and for several minutes the well discharged a column of water to a height of at least 100 feet, making a splendid sight, and a noise which is said to have been heard for a distance of 10 miles.

As soon as possible the gas was divided into seven 2-inch jets, one of which was sufficient to run the engine, the gauge showing a pressure of 75 pounds to the square inch. Calculations, as accurate as it is possible to make, showed a total pressure of not far from 350 pounds to the square inch, and a flow of more than 500,000 cubic feet of gas per day. Each day the volume of gas seemed to increase and then occurred to some capitalists the feasibility of carrying the gas to Titusville to supply the many manufacturing firms and private families with it as fuel, and to this end the well was purchased by Henry Hickley, Esq., of Titusville, who had the product of the well measured, which revealed the fact that it was producing over 4,000,000 cubic feet per day. On the first day of August, 1872, the gas was conveyed through a 2-inch pipe to the city of Titusville. This 2-inch pipe was found after a short time inadequate for the demand and a line of 3¼-inch pipe was laid down, and supplied 250 firms and private families with gas for heating and lighting purposes.

Of the many striking features of the Pennsylvania oil region, Gas City, Cranberry township, Venango county, was one of the most remarkable. It is called Gas City because of the large amount of gas flowing from its wells, of which there were some 30 producing oil. The town had about 40 houses, composed principally of hardware stores, groceries, restaurants, etc.,

and these were all heated and lighted by gas from one well. Each well had gas enough to make steam for its engine and to light the engine and boiler house, and each engine house used for light as much gas as would supply a large hotel, and wasted more than would supply a town of 5,000 indabitants. At each well there was a pipe run from the well to some distance, through which the waste gas was burned at an elevation of 15 to 20 feet.

GAS WELLS AT EAST SANDY.

There was a remarkable gas well at East Sandy, in the Pennsylvania oil region, which was struck in the spring of 1869. It caught fire and resisted all efforts to extinguish it, and burned for a little more than a year, lighting up the surrounding country for a great distance. The rush of gas and flame roaring like a cataract could be heard for miles. After partial exhaustion the gas was conveyed in pipes in some instances upwards of half a mile for use on both drilling and pumping wells. The amount of gas produced daily by the well is not known, having never been tested. But some idea of it may be gathered from the fact that it has supplied gas to 20 pumping and drilling wells at one time. In some instances this gas was utilized directly into the engine, like steam as a motive power, the steam gauge indicating a pressure of 80 to 90 pounds to the inch.

The presence of large quantities of gas in the Pennsylvania oil region usually indicates the presence of an abundance of oil in the neighborhood. East Sandy offering such inducements, oil men, prominent among whom were F. W. Andrews, of Titusville, commenced operations. Success was not so great as expected, yet quite a number of good paying wells were found.

THE PHENOMENA OF OIL AND GAS WELLS.

As every human being has his own set of features, tone of voice, and the like, so each individual well has its characteristics, whether it be a flowing or pumping well. All differ in regard to the flow of water, gas or petroleum. In one the flow of oil will be continuous and uniform, day and night, not ranging more from week to week than a spring brook. In others the flow will be intermittent, but with precise regularity as to time; others again flow at intervals.

It is recorded of The Coquet well—Hyde and Egbert farm—that it emitted a succession of sounds as loud and sharp as the exhaust of a small steam engine, occurring in regular order every 10 seconds, in such a manner as 1, 2, 3, 4; 1, 2, 3, 4, and sometimes two or three coming off together by an extraordinary effort. The Wild Cat and Yankee wells remained silent for 40 and 20 minutes respectively, and then began to foam and flow, the oil coming off at first only in drops, but increasing by degrees until it belched forth with terrifying force and power. These discharges then decreased in violence and finally fell off entirely, after the lapse of from fiv to eight minutes. Each escape of liquid was accompanied by a sharp report, heard at the distance of a hundred yards or more. Some wells have remained quiescent for 21 or 22 hours in the day and then have broken forth in one continuous flow, or a succession of belchings, for two or three hours. A few wells have run for six hours and then subsided or distributed their favors over 12 hours in the 24. The Dunn well on the Watson flats produced freely from morning till mid day; then the supply diminished or stopped altogether for the rest of the day, the pump bringing little but salt water. In the case of pumping wells, with each revolution of the band wheel, all things being in working order, a discharge of oil, or salt water, or both, takes place.

It is not difficult to account for the phenomena of flowing wells. Gas seems to be the life blood of these remarkable wells. Professor Winchell, in an article on gas wells intelligently disposes of the question, which is here appended:

"The escape of oil at the surface of a well is caused sometimes by mere hydrostatic pressure, as water rises in a common artesian well. More frequently, perhaps, the oil is forced up by the elastic reaction of confined gases. An open cavity, or a porous portion of rock, bounded on all sides by impervious walls—which constitutes a virtual cavity—may be partly filled with oil, while gases occupy the higher portions of the cavity. Such a cavity, whether actual or virtual, may possess any form or extent, or may consist of a number of cavities connected by narrow passages or mere fissures. In nearly all cases more or less gas accompanies the oil and subsists under a very high degree of pressure. The pressure in such cases is not the hydrostatic pressure of water, but a consequence of the continual generation of gas and oil long after the cavity had been filled. If the drilling happens to penetrate the higher portion of such a cavity the gas at once rushes forth with greater or less violence and persistence. As soon, however, as the tension is relieved the escape ceases. No oil will be obtained in such a case without applying suction, since there is no hydrostatic pressure exerted from behind, and the reaction of the gas tends rather to confine the oil in the lowest ramifications of the cavity.

"Suppose, however, that on drilling a hole for oil we happen to penetrate some of the lower portions of the cavity occupied by the oil. The elastic pressure of the confined gas above will at once force the oil up, and produce a spouting or flowing well. The flow must necessarily subside by degrees, as the confined gas, by the escape of the oil, acquires more space for its accommodation. It may continue, however, until the cavity is exhausted of its oil, after which pumping will be of no avail. If the confined gas attains its equilibrium before the oil has been completely forced from the cavity, it is evident that the remainder must be obtained by pumping.

"Intermittent wells appear to act in some cases precisely after the manner of intermittent springs. More frequently, however, it is manifest that the combined action of gas and oil produces the phenomenon. In drilling a well, suppose a volume of

gas is struck over one hundred feet from the surface of the rock, and a small stream of oil twenty feet below the gas. The entrance of oil fills twenty feet of the hole, and begins to submerge the fissure at which the gas is escaping. The gas forces its way through the oil with a sputtering sound, bubble after bubble rising to the surface. As the oil ascends, the gas makes louder and louder complaints, till, finally, summoning all its accumulated energies, it hoists the superincumbent column of oil to the surface, and pours it out in a few seconds' duration. The flow then ceases, and the same operation begins to be repeated. After a minute or more, renewed grumbling and sputtering, the pent-up gas again relieves itself, and thus the work continues. The same result would ensue if oil and gas found entrance at the same fissure, or even if the gas were admitted at any distance beneath the entrance of a small supply of oil."

In evidence of the truth of Professor Winchell's conclusions, I may instance a case in point. On the main street of Rouseville, Venango county, Pa., is the site of an old well, drilled some years ago, which was pumped, and long since abandoned; it is now covered with earth, and hidden from view. This well, with the regularity of time, flows oil and gas once a month. The cause is obvious: evidently the gas accumulates, carrying with it oil, forcing itself through the resisting earth.

THE PRODUCTION OF NATURAL GAS IN THE UNITED STATES.

ITS ORIGIN, USE AND THE FORTUNES INVESTED IN SUPPLYING IT TO CONSUMERS.

Natural gas is the most perfect and convenient fuel known. It is found in nature perfectly prepared for use, stored in immense reservoirs under such high pressure that, when tapped by the drill, it furnishes the power to transport itself hundreds of miles through pipe lines to the consumer. No artificial gas compares with it in heating power, 1 cubic foot of it being sufficient, with proper appliances, to evaporate a pint of water. It is instantly available for use by merely turning the valve and the fire can be extinguished the moment the service is completed. When properly burned, it leaves no soot, ashes or other residue.

Among some of the nations of Asia, notably China and Persia, the use of natural gas "antedates authentic history," and in the United States its existence has been known for more than a century. In 1775, General Washington, while locating lands received in payment for military service, visited a burning spring on the Great Kanawha River near the site of the present city of Charleston, W. Va. He pre-empted the tract containing the spring and dedicated it, together with an acre of surrounding ground to the public forever.

The first recorded use of natural gas in the United States was in 1824, at Fredonia, N. Y., where it was piped from a well to illuminate the village inn in honor of the visit of General de Lafayette.

A few years later, in 1841, William Thompkins struck a large flow of gas just above the burning spring in the Great Kanawha valley, and used the gas for heating salt furnaces. Early in the history of oil-well drilling, which began in 1859, the waste gas which almost invariably escapes from oil wells was used for firing the boilers of the drilling engines, and it was very soon piped to houses of the oil producers, where it was used for light and fuel, and large out-door flambeaus were burned at the wells. But it was not until 1874 that its great value as a manufacturing fuel was demonstrated. In that year Messrs. Rodgers & Burchfield began to burn it under boilers and for all the puddling and heating furnaces in their plant at Leechburg, Armstrong county, Pa. The advantages and conveniences were at once apparent, and the use rapidly increased. By 1887, 96 rolling mills and steel works were either wholly or in part supplied with this fuel, and by 1890, it is estimated that it displaced annually 10,000,000 tons of coal.

In the earlier days of its production, the original "rock" pressure of the wells (the pressure of the reservoirs as shown by closed-in wells) was so great and the producing area so extensive that the supply of gas was believed to be practically inexhaustible. As a result the gas was wasted in the most extravagant manner. Wells were permitted to discharge their product into the air and little or no effort was made to check the flow. Frequent escape pipes and flambeaus were provided to lessen the pressure on the pipe lines and to consume the surplus gas. No effort was made to measure the amount furnished to a consumer, and as a consequence it was burned in a very wasteful manner. However, between 1885 and 1890, the earlier fields began to show unmistakable evidences of depletion, and as a result, the gas became more valuable. Meters and other saving appliances were employed, and, while the quantity of gas consumed probably decreased in five or six years to less than half the former yield, the price was increased to such a degree that the total value of the product showed but little decline. Since 1895 the value has increased, and since 1898 both the amount and value of gas consumed has increased until in 1901 the value of the product probably exceeded $25,000,000. The amount sold in 1900 was 127,000,000,000 cubic feet, and if the rate of increase continued during 1901, as the statistics of some of the largest gas companies indicate, the amount consumed was 150,000,000,000 cubic feet, equivalent to one cubic mile. The largest gas holder yet constructed is of 5,000,000 cubic feet capacity, and the supply during 1901 would be sufficient to fill it 30,000 times, an amount which would furnish nearly 1,000 cubic feet per month to every family in the United States.

GAS WELLS.

The supply of gas is obtained from more than 10,000 wells of depths varying from a few hundred feet to more than 3,000 feet, and of an aggregate depth which would penetrate from the surface almost to the center of the earth. Three thousand miles of casing and tubing are in these wells.

The rock pressure of these wells varies greatly. In old, depleted territory it is practically nothing, and the only way of securing an additional supply is by diminishing by means of pumps the pressure at the mouth of the well below that of the atmosphere. However, in new fields, especially those drilled to the deeper sands (2,500 to 3,500 ft. deep) the pressures frequently exceed 1,000 pounds to the square inch. Some of the largest wells known, if unconfined, would discharge into the air at least 25,000,000 cubic feet per day, although an average "open flow" volume is probably not more than 250,000 cubic feet. The quantity actually obtained is but one-fifth of this amount, as most wells discharge against more or less line pressure and under normal conditions quite a large proportion of the wells are "shut in" as a reserve supply until needed. The roar resulting from the "blowing off" of some of the largest wells into the open air is terrific. Formerly it was considered impossible to shut in some of the largest wells until they had become partially exhausted. It was several months after the "Big Moses" well in Tyler county, W. Va., was "struck" before it was controlled. The roar was so great that voices could not be heard within 200 feet of the well. When the Robinson well, in Wetzel county, W. Va., was struck, six years ago, it was deemed unsafe to confine the gas, and the pipe line was laid to the well, the connections made, and the gas turned into the line, without shutting in the well. The gate on the well was not closed until four years after it was drilled. In 1844, while drilling a salt well in West Virginia, near the burning spring referred to above, so strong a flow of gas was struck that it threw the drilling tools, weighing about 1,000 pounds, out of the hole. Since then there have been several instances of much heavier tools being forced out of the hole by the pressure.

DRILLING WELLS.

The means employed in drilling gas wells are identical with those in use in drilling oil wells.

NATURAL GAS PIPE LINES.

In the handling of natural gas a system of pipe lines is necessary to connect the producing wells and the cities and towns where the gas is consumed, as well as an additional system to distribute the gas throughout the cities to the individual consumers. In the earlier period of the industry it was not believed possible to conduct gas at high pressure for great distances, and in the light of present knowledge it seems incredible that less than 25 years ago it was believed by a few that gas, being elastic, could not be forced through lines at high pressure, under the erroneous idea that the friction on the sides would retard the flow, while the continued inflow would increase the pressure sufficiently to burst the pipe.

In 1881, Spang, Chalfant & Co. piped gas from Millerstown, Pa., to their mills on the Allegheny River opposite Pittsburg. One of the first large gas mains of any considerable length was laid in 1882, by Mr. J. C. McDowell for the United Pipe Lines, which have since been included in the National Transit Company. It was an eight-inch line twenty miles long, connecting a well near Wilcox with the pumping station at Colegrove, McKean county, Pa., where it supplied the boilers. About the same time, a line was laid from McKean county, Pa., to Buffalo, N. Y. Between 1882 and 1885, natural gas came into general use in most of the cities and villages of western Pennsylvania and southwestern New York.

As the adjacent fields became depleted, the gas has been brought from greater and greater distances through pipe lines until at the present time Pittsburg is receiving gas from Doddridge county, W. Va., more than 100 miles distant; Akron, Canton, Cleveland and Toledo, Ohio, receive their supply of gas from Wetzel county, W. Va., a distance of 150 to 300 miles; and Chicago from central Indiana.

The pipes used for these conductors vary in size from two inches to three feet in diameter. For the most part the pipe is wrought iron or steel. The smaller pipes (10 inches in diameter and under) are usually made of screw-joint pipe, although in the last few years plain end pipe with couplings and rubber packing has become very popular, and is in a large measure taking the place of screw pipe, it being equally cheap in cost and is more readily laid. Sizes from ten inches to two feet in diameter are frequently laid with "Converse" pipe, which consists of plain end pipe with the joints of heavy cast-iron sleeves or hubs fitted by molten lead which is caulked into the space between the pipe and the sleeve. The disadvantage of this point is one common to all lead joints in that the packing material, being inelastic, becomes loosened by the settling of the pipe and by the slight movement due to changes in temperature. By a re-enforcement with rubber packing pressed against the outside of the joint by iron clamps, a very satisfactory connection is made, and frequently a pipe line of this construction has been operated to upward of 300 pounds pressure to the square inch. Pipes above two feet in diameter are either cast-iron water-pipe or steel pipe riveted after the method of boiler plating. A line of riveted steel pipe, 36 inches in diameter, extends from Pittsburg 20 miles to the southward, and cost to construct approximately $50,000 per mile. In times of maximum demand it passes daily over 100,000,000 cubic feet of gas.

The length of pipe of all sizes in the various transportation systems of this country is from 15,000 to 20,000 miles. In addition there are from 7,000 to 10,000 miles of pipe in the various distributing

systems in cities using natural gas. Thus in the aggregate there is approximately 25,000 miles of natural gas pipe lines in operation, and it is estimated that the lines cost $150,000,000, not counting the drilling, the tools, offices, pump stations, leases and rights-of-way, which would amount to $150,000,000 more, or $300,000,000 all told.

For the most part the power necessary to transport the gas through the pipe lines is furnished by the natural rock pressure of the wells. In many places, however, the well pressures are so nearly exhausted, or the distances to be transported are so great, that this source of power is insufficient, and it is necessary to supplement it artificially by pumping. Where the pressure is small and the lift 10 pounds or less, as in drawing gas from depleted territory for nearby consumption, some form of rotary blower has been used successfully, but for higher pressures a cylinder gas compressor is necessary. Among modern gas pumping machinery are some of the finest specimens of mechanic art. Probably nowhere has a greater amount of work been done with the same expenditure of fuel than has been accomplished in gas compressors; in fact, it is doubtful if the results have been equaled in any other power plants. An indicated horse power has been maintained for one hour with less than the equivalent of two-thirds of a pound of coal. Thirty cubic feet of gas have been compressed from the atmospheric pressure to 270 pounds gauge pressure with the expenditure of but one cubic foot of gas in producing the power. This result was, of course, obtained only by the use of a gas engine.

GAS MEASUREMENT.

There are four methods in vogue for measuring gas, namely: (1) By meters, (2) by Pitot tubes, (3) by computation from the initial and discharge pressures and size and length of pipe line, and (4) by computing the output of the well from the volume of the hole and minute pressure.

1. Meters.—The method of measurement by meter is in most frequent use. The meters for the most part depend for their operation on two principles: one is the actual measurement of the gas by passing the whole volume through pockets or bellows of given capacity which fill and empty by the movement of a series of valves operated automatically by the flow of gas through the meter. Where the quantity of gas is so great as to need very large and expensive meters thus to measure it directly, another method—the proportional meter—is used. In this device, two routes, differing greatly in size and capacity, are available for the passage of gas through the meter. The flow through these two channels is controlled by a valve in each so arranged that they operate in unison, or in such a manner that the ratio between the discharge of the two branches remains constant. One of the direct measuring meters is placed in the smaller branch and the flow through it is measured, from which the total amount passed by the meter is easily calculated. In general use a special dial is attached to the small meter, from which can be read the entire amount of gas passed. When gas is passed through a meter at a higher pressure than the standard at which it is sold, it is necessary to make a correction to the meter reading due to the extra pressure on the gas. The usual standard at which gas is sold is four-ounce gauge pressure, and a simple formula for reducing to this pressure is as follows:

$$Q = q \frac{p + h,}{h + 0.25} \text{ in which}$$

Q=cubic feet of gas at 4-oz. pressure,
q=cubic feet as shown by meter,
p=gauge pressure in pounds per square inch,
h=pressure of atmosphere in pounds.

Since the pressure of the atmosphere is about 14.75 lb., this becomes

$$Q = q \frac{p + 14\ 75.}{15}$$

Self-recording pressure devices can be attached to meters operating at high pressures by means of which the average pressure and the actual quality of gas passed can be quickly determined.

2. Pitot Tubes.—The amount of gas passing through a pipe line can be quite accurately determined by means of the Pitot tube, which consists of a small metal tube inserted in the line, having its open end turned in the direction from which the gas is flowing. This tip communicates with one branch of a glass U-tube partly filled with some liquid (generally water). The other branch of the U-tube is connected to an opening in the pipe line, the plane of which is at right angles of that of the opening into the Pitot tube. By this means the branch connected to the Pitot tube will show a higher pressure than that connected to the pressure line, due to the force of the current of gas flowing against it. This difference of pressure will be shown by the difference in level of the liquid in the U-tube. Since this force is due to the velocity and density of the gas passing, the rate of flow can be obtained, and with frequent observations, the quantity of gas passing through the line can be readily determined. The formula of the Pitot tube as applied to gas measurement has been very carefully determined by Prof. S. W. Robinson, whose report is published in the Geological Survey of Ohio, Vol. 6, pp. 548-594. The final formula is:

$$Q = 1{,}690 d^2 \sqrt{h\left(1 + \frac{p}{15}\right)}, \text{ in which}$$

Q=number of cubic feet of gas flowing in pipe line per hour,
d=diameter of pipe line in inches,
p=static pressure of gas in pounds,
h=difference in level of water in U-tube, measured in inches.

This formula is computed for gas flowing through the tube at a temperature of 40° F., but reduced to

a standard temperature of 50° F. in the measurement by this formula. It is for gas of 0.60 sp. gr. To reduce to gas of any other gravity multiply by

$$\sqrt{\frac{0.6}{\text{Sp gr gas}}}$$

3. Computation from Pressures at Two Given Points.—It is possible to determine with considerable accuracy the quantity of gas passing through a pipe line from the pressures at two given points when the distance between them and the size of the line are known. The formula for this purpose is:

$$Q=40d^2\sqrt{\frac{(p_1^2-p_2^2)d}{LD}}, \text{ in which}$$

Q=cubic feet of gas passing in one hour,
p=absolute pressure in pounds (gauge pressure+15 lb.) at initial point,
d=diameter of pipe in inches,
L=length of pipe between points in miles,
D=density of gas.

Probably the most complete study of this method has been made by Mr. Forrest M. Towl, who has constructed a slide rule for determining at sight the discharge of any line.

4. Computation of the Output of a Well from Its Minute Pressure.—A fair approximation of the output of a well at atmospheric pressure can be obtained from the capacity of the hole in cubic feet, and the increase in pressure of a well in one minute after it is shut in. The formula for this purpose is:

$$Q=\frac{d^2\times 3.1416\times L}{4\times 144}\times\frac{p}{15}\times 60\times 24, \text{ in which}$$

Q=quantity in cubic feet of gas discharged into the open air in twenty-four hours,
d=diameter of hole in inches,
L=depth of hole in feet,
p=pressure in pounds shown by gauge one minute after closing gate (less any pressure gauge might have shown before closing gate).

Reduced to lowest terms, this becomes approximately $Q=\frac{1}{2}d^2Lp$, or the output of a well in one day is equal to one-half the product of the square of the diameter of the hole in inches by the depth of the hole in feet by the pressure in pounds per square inch. Of course, if a well is tubed, the diameter of the tubing is used instead of the diameter of the hole, and if the packer is above the bottom of the hole, the capacity of the tubing to the depth of the packer is first obtained and to this is added the capacity for the full size of hole for the distance from the packer to the bottom of the hole.

If the output of the well is desired at any other pressure than that of the atmosphere, the gate on the well is closed as before and the rise in pressure noted for one minute from the instant the pressure reaches the desired point, this amount being used for the minute pressure.

Geologic Sources.—Although small quantities of gas are always present in the decomposition of animal and vegetable matter, the principal sources of natural gas are from porous strata of rock, usually at considerable depth below the earth's surface. The strata are chiefly sand, gravel, shale or limestone lying between more impervious layers. Petroleum is frequently discovered in these same strata, although from much more limited areas than those producing gas. The deposits are found in various portions of the world in the strata of all periods from the Silurian to the Tertiary. The great gas reservoirs overlying the Cincinnati arch are located in the Trenton and Clinton limestones of the Silurian period. Those of the Appalachian system are in the Devonian. In eastern Ohio they belong to the Sub-carboniferous period. Those of the southwestern States and California are in the Tertiary formation, as also are those of Eurasia. In the oldest formations, i. e., the Trenton limestone, the gas is found in the upper layers of the limestone itself and directly underneath the Utica shales. In the Clinton limestone, the source of gas appears to be a layer of sand within the limestone. The only source of gas in the Appalachian reservoirs is from layers of sand rock enclosed by limestone or slate. In the Tertiary formation, the gas comes from beds of sand which are frequently so soft as to hardly merit the name of rock. The natural gas is usually obtained from the most elevated portions of the stratum, i. e., along the anticlinals of the rock, while the petroleum collects on the lower horizon and frequently salt water is found on a still lower level along the synclinals of the rock. This anticlinal theory for the location of gas and oil is very thoroughly discussed by Prof. I. C. White, State Geologist, in the West Virginia Geological Survey, Vol. 1, 1899, pp. 158-180, and by Prof. Edward Orton, State Geologist, in the Geological Survey of Ohio, Vol. 6, p. 89 and following. The essentials of the theory are that the natural gas, being the lighter product, collects at the top of the reservoir, formed by the porous rock under the impervious layer, while the oil and water arrange themselves in the same layer in accordance with their respective gravity.

The most prolific natural gas fields thus far developed have been (1) those along the western slope of the Appalachian mountain system extending from the Canadian border to Tennessee, and (2) those throughout the great anticlinal extending from Kentucky to and even beyond Lake Erie, known as the Cincinnati arch, with its center near Cincinnati. Between these two large deposits is a marked synclinal, which, at its lowest point near the Ohio River in northwestern West Virginia, is many thousand feet below the crest of the Cincinnati arch on the one side and of the Appalachian mountain system on the other.

1. Appalachian Gas Fields.—The Appalachian gas deposits occur in the small folds or anticlinals which exist in the strata as they rise toward the Alleghany Mountains from the synclinal that lies to the westward. At the deepest place of this synclinal, in Wetzel county, W. Va., the Pittsburg coal drops

almost to the level of tide-water. A few miles west of Pittsburg the coal in this synclinal is about 900 feet above tide level. In Armstrong county the rocks have risen 1,100 or 1,200 feet higher, and from this region the rise is quite uniform to the New York boundary at a rate of about 32 feet to the mile.

In lines approximately parallel with this synclinal on the one side and the ranges of the mountains on the other, are a series of small folds, the crests of which are from a few feet to 300 or 400 feet above the adjacent synclinals, and in these small anticlinals nearly all the great deposits of the Appalachian system have been found.

As has been observed in the main trough between the Cincinnati arch and the Alleghany Mountains, all the strata dipped downward in a line from the northeast toward the southwest. In the northern portion for the first 50 miles south of the New York boundary this dip amounts to about 30 feet to the mile. For the next 50 miles, or to about the line of Pittsburg, the dip is about 20 feet to the mile, while south of Pittsburg it does not average more than 9 or 10 feet to the mile.

The gas deposits of southern New York and of McKean, Elk and Warren counties, Pa., are found in several different strata of sand included in the Chemung group of the middle Devonian period. The deepest of these sands are those producing gas in Elk county, which are about 200 to 250 feet below the Bradford sand. From the Bradford sand there is an interval of about 300 feet to the Cherry Grove sand, and about 400 feet above this is located the Warren sand. The most productive sands because of their vast extent are those of the Venango and Butler group. These are found from 600 to 1,000 feet above the Warren group in the Catskill epoch of the Upper Devonian period. In Butler and Venango counties there are three distinct strata of these sands with an interval between them of a little more than 100 feet. Gas from some of the strata of this group has been obtained from Crawford county southward to Kentucky. The sands are known by various names in different localities. In Crawford, Venango, Butler, Clarion and Forest counties they are known as the first, second and third oil sands. In Armstrong, Allegheny, Westmoreland and Washington counties the upper layers are known as the Murraysville or salt sand and the Hundred Foot sand, while the lower layer is broken into a number of strata known under the names of Gordon, Gordon Stray, Fourth and Fifth. South of the Pittsburg district, the Hundred Foot divides into the Thirty and Fifty Foot sands, and below the Gordon are found the Fourth, Fifth, Bayard and Elizabeth sands in the above order. North of Pittsburg is observed a thick layer of sandstone, the lower edge of which lies two or three hundred feet above Number One of the Venango group. This layer is about 300 feet in thickness, and outcrops in Butler and Venango counties, in the latter region being found only on the hill tops, from which it secured the name of Mountain Sands. From the Pittsburg region southward it is known under the name of "Big Injun," and is productive of gas and oil in many localities.

The strata generally increase in thickness to the southward, consequently the interval between the sands becomes greater. There is an exception to this rule, however, between Green county and Wetzel county, W. Va., where the interval diminishes slightly.

Gas Deposits About Cincinnati Arch.—The Trenton limestone of the Silurian period has an elevation at the crest of the Cincinnati arch of more than 400 feet above tide level. From this region it rapidly falls until at Columbus, Ohio, it is 1,200 feet below tide level, and from thence eastward the decline is very rapid, equalling 3,000 feet to the Ohio River at East Liverpool. To the northward it declines to about 600 feet below tide level, where the crest of the anticlinal passes under Lake Erie in Ottawa county. At Indianapolis it is 280 feet below tide level. From the crest of the arch, in Claremont county, just east of Cincinnati, two marked anticlinals extend, one a little east of north toward Lake Erie, and the other more marked branch extends northwestward into Indiana, apparently passing through Union, Fayette, Wayne, Henry, Delaware, Madison and Grant counties. Prof. Orton concludes that the northwestern branch was first elevated and that later there extended northwestward from it what is known as the Lima axis. Near Findlay, Ohio, this meets an abrupt terrace passing due north and south, and causes the anticlinal to change direction at that point. The vast gas deposits of Indiana and Ohio are found on the northwestern anticlinal of the Cincinnati arch and along the Lima axis and the crest of the Findlay terrace.

Besides the Trenton deposits, there are those of the Clinton limestone in Fairfield and Licking counties, Ohio, which appear to be along a terrace in that rock. Also in eastern Ohio gas is obtained from the Berea sandstone of the Sub-carboniferous period.

While the principal gas deposits are along the crests of anticlinals, they are greatest where there is a considerable dip from the crest of the anticlinal downward. An essential to a gas reservoir is a layer of impervious rock above the gas horizon.

DESCRIPTION OF GAS DEPOSITS.

As above stated, the two great sources of natural gas on this continent are along the western slope of the Appalachian Mountains and the great Cincinnati arch. These two fields supply fully 95 per cent of all the gas produced in North America. Besides these, Kansas, Arkansas, Indian Territory, Texas, California and Colorado yield smaller quantities. However, for the past eight or nine years the actual amount of gas produced in Indiana has exceeded the Pennsylvania production, which is due to the fact that the price of gas obtained in Indiana has been exceedingly low. From 1888 to 1892, when the Indiana fields were being rapidly developed, both Ohio and Pennsylvania were producing large

quantities of gas, and in order to secure the removal of manufactories to this territory, contracts at a very low price for long periods were made. In like manner, franchises for gas in Indiana cities were made with imposed conditions that were then easily complied with, but as the supply has diminished, are now very burdensome. The prices for manufacturing contracts were based on output, and for domestic consumption on the number of fires or size of openings in the burner instead of by meter. The average price of gas in this State is but little more than one-half the price of coal or wood displaced, while with equal economy its price should exceed coal owing to the greater convenience and cleanliness, a condition that is true for almost all other localities.

Pennsylvania Gas Fields.—Gas first began to attract attention as a fuel during the development of the Bradford and adjoining oil fields. In many sections in this region wells of high rock pressure and great volume were found and while the rock pressure now is, generally speaking, small, large quantities are still taken from McKean and the adjoining counties of Elk and Warren. However, before its value as a fuel was appreciated, the extensive fields about Pittsburg had been discovered. Among the first of these was at Murraysville, located 15 miles east of Pittsburg, a field of moderate depth, showing a loose sand, which yielded consequently a great volume of gas. The first well in this field, Haymaker No. 1, was opened November 4, 1878, in drilling for oil. No attempt was made to use the product of this well for four years, and very little drilling was done in the field until 1884. A short distance to the east of Murraysville was the Grapeville field, which, though much smaller than the Murraysville field, contained wells of very large volume. Probably more gas was wasted from both these reservoirs than was ever utilized.

In the same month that Haymaker No. 1 was opened, the first well was struck near Tarentum, and as the supply from Murraysville and Grapeville diminished, this also was piped to Pittsburg, and as was needed, gas was brought from Canonsburg, Hickory and Venice, to the southwest. While the rock pressure is now very small in these various fields, and, while some of them have become entirely exhausted, they have showed wonderful lasting qualities. Armstrong county has been producing gas for nearly 20 years and still yields a daily output approximating 50,000,000 cubic feet.

About 1890 the development of the territory south of Pittsburg began, although gas had already been discovered and used to considerable extent about Washington, Pa. Later the developments extended into Green and Fayette counties. At present the most prolific territory is in Green and Washington counties, where a "Bayard" sand pool was discovered in 1897. The sand lies about 300 feet below the Gordon sand and 2,435 feet below the Pittsburg coal. This pool has been explored from within a few miles of the West Virginia line northeastward to a point about five miles north of the Washington and Green county line. It is about 25 miles long, with a width of three or four miles. The rock pressure of the wells varied from 800 to 1,200 pounds, and still shows from 400 to 1,000 pounds, although the average daily output during the past two years cannot have been less than 75,000,000 cubic feet.

West Virginia Gas Fields.—In West Virginia the most prolific sands are the Gordon and those grouped near it, namely, the Gantz, Gordon, Stray, Fourth, Fifth, and in some few places, the Elizabeth or Bayard sand; many large producers also have been secured from the shallower sands. Although vast quantities of gas have been taken from these reservoirs, they are the most extensive and prolific known at present. Vast areas of natural gas deposits exist in Wetzel, Marshall, Marion, Monongalia, Tyler, Harrison, Doddridge, Lewis, Ritchie, Gilmer and Calhoun counties, and many others farther south. Wells have been drilled which show rock pressures exceeding 1,200 pounds and volumes of from 12,000,000 to 20,000,000 cubic feet per day, while some have been estimated as high as 50,000,000 cubic feet. If this supply is properly conserved, it will furnish vast quantities for many years, not only for local consumption, but for transportation to markets in Ohio and Pennsylvania which are now being supplied for the most part from the less distant fields. Unfortunately for the preservation of the gas, the deposits are almost invariably associated with oil pools, from which the gas is discharged with the oil, and in the past little effort has been made to restrain its flow. From one region in Wetzel and Tyler counties, embracing 100 square miles, with an original rock pressure of about 1,000 pounds, fully one-half of the entire supply has been wasted. It is a matter of regret that there is no satisfactory legal protection for this product. However, the value of gas is now becoming so universally understood and the principal oil producers are either directly or indirectly interested in the gas companies, so that the former waste has very appreciably decreased and there is reason to believe a new era of economy in gas production and preservation has begun.

Ohio Gas Fields.—The chief supply of gas in this State, i. e., the reservoir in the Trenton limestone, has been practically exhausted. This field originally embraced 500 or 600 square miles in the northwest portion of the State and had a uniform rock pressure of over 400 pounds. At present the pressure is nearly exhausted, and the wells drowned with salt water. In the eastern portion of the State quite a large quantity of gas was obtained from the Berea sandstone. However, the only source of any considerable supply at present known in the State is the Sugar Grove field south of Lancaster and the recently discovered Licking county field to the north of it. The gas in these fields comes from wells in the Clinton limestone 2,000 feet or more in depth and showed originally about 750 pounds pressure. The Sugar Grove field was first opened in 1887 and already shows no more than one-third of

the original rock pressure. The amount of gas produced in Ohio reached its maximum in 1888 or 1889. From thence it steadily diminished until 1897, although later the production has increased considerably and the value of the product has nearly doubled. This increase in value has been due in a measure to a more economic method of handling resulting from an extensive adoption of the meter system of measurement. It seems probable, however, that the maximum production has about been reached and existing companies are making extensive preparations for securing large quantities of gas from West Virginia.

Indiana Gas Fields.—The productive area in this State originally extended over an area of between 2,500 and 3,000 square miles, located from the center of the State eastward and northward to the Ohio boundary. The source was from the Trenton limestone. Originally the fields showed a nearly uniform rock pressure of 325 pounds, which now varies from zero to 150 pounds. For the past nine years this state has produced more gas than any other, but the fields have become greatly depleted. Large compressing plants are installed to diminish the line pressure at the wells and to furnish power to transport the gas to points of consumption. It would seem that these more and more expensive methods of gas production must soon prevent the successful conduct of the gas industry in many portions of this territory unless relief is obtained from the uneconomic methods of consumption due to lack of meter measurement and a price obtained for the product more commensurate to its value.

THE ORIGIN OF NATURAL GAS.

Many theories of natural gas have been advanced, but the one which meets with most general acceptance is that propounded and discussed so ably by Prof. Edward Orton, in the Geological Survey of Ohio. Briefly stated, the theory is that gas and petroleum are the results of decomposition at moderate temperature of vegetable and animal matter, chiefly in the stratum where found. There seems to be little doubt expressed at present that its source is organic rather than inorganic, and, while there are many adherents to the theory of distillation by heat, this latter theory is losing ground because, as a rule, there are no noticeable evidences of heat and, furthermore, it can be shown that a process of this character is unnecessary.

CHEMISTRY OF NATURAL GAS.

Natural gas is composed principally of the gaseous hydrocarbons of the paraffine group, whose general formula is C H $\div$. Besides the paraffines, there are small but varying amounts of the following gases: nitrogen (N), carbonic acid gas (CO), olefiants, oxygen (O), ammonia (NH), hydrogen sulphide (H S) and hydrogen (H). The paraffines, however, amount to 90 or 95 per cent. of the entire volume of the gas, and consist principally of marsh gas or methane (CH). Frequently it is the only member of the series present. It seems difficult to separate the various members of this group, but the presence of the heavier members is frequently shown by the increased gravity, the increased heat units in its combustion and by the smaller proportion of water to carbonic acid gas in the products of combustion. The following table of the properties of the first three members of the paraffine group (the ones most frequently present) has been compiled from data in Schorlemmer's Hand Book of Chemistry and from the work of Prof. F. C. Phillips, which is published in the Pennsylvania Geological Survey, 1892.

Properties of the three lighter Members of the paraffin group.

Name	Chemical Formula	Carbon by Weight	Hydrogen by Weight	Specific Gravity	Weight per Cu. Ft.	Liquefying Pressure	No. B.T.U. per Cu. Ft.a
Methane (marsh gas).....	CH	74.97	25.03	0.533	0.0446	2,650 at 10° F	1,064
Ethane	CH	79.96	20.04	1.034	0.0837	676 at 39° F	1,863
Propane	CH	81.78	18.22	1.45	0.12303	550 at 39° F	2,662

It is observed that the lower members of the series increase in specific gravity and in available heat units at a fairly constant ratio, each member yielding approximately 800 heat units to the cubic foot more than the one preceding. It should be observed also that the pressure on many natural gas reservoirs exceeds the liquefying pressure of the gas in all but the first member of the group. Consequently in such reservoirs all ethane and propane exist as a liquid, and are only vaporized at the bottom of the well as the pressure is reduced at that point. Since these gases are much richer in heat units than methane, it would seem probable that as the pressure of gas fields containing these liquids depletes a large proportion of them would vaporize and result in a richer gas being produced than in earlier stages of production. The next lower member, butane, of the series remains, in its normal state, a liquid at atmospheric pressure and 33°F. and consequently does not vaporize in large quantities under normal line pressure. The boiling points of the remaining members of the group are sufficiently high to preclude any large amount of their vapors being present in the gas.

Besides the paraffines, small quantities of the illuminants, or the olefiant series (C H), have been observed. About the only member of which an appreciable amount has been observed is ethylene (C H). The analysis of gases from the Trenton limestone in Ohio and Indiana as given in the Geological Survey of Ohio, Vol. 6, page 137, show about 0.25 per cent of olefiants.

The subjoined tables give a number of analyses of natural gas from various fields in New York, Pennsylvania, West Virginia, Ohio and Indiana.

Analysis of natural gas of New York and Pennsylvania, made by Prof. F. C. Phillips.

	Fredonia, N. Y.	Sheffield	Kane	Wilcox	Speechly	Murraysville	Raccoon Creek	Baden	Houston
Nitrogen	9.54	9.06	9.79	9.41	4.51	2.02	9.91	12.32	15.30
Carbonic acid	0.41	0.30	0.20	0.21	0.05	0.20	Trace	0.41	0.44
Hydrogen	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
Ammonia	0.00	0.00	0.00	6.00	0.00	0.00	0.00	0.00	Trace
Oxygen	Trace	Trace	Trace	Trace	Trace	Trace	Trace	Trace	Trace
Hydrogen sulphide	0.00	0.00	0.00	0.00	0.00	0.00	Trace	0.00	0.00
Paraffines	90.05	90.64	90.01	90.38	95.42	97.70	90.09	87.27	24.26
Total	100	100	100	100	100	100	100	100	100
Per cent by w't of carbon	78.14	76.69	76.77	76.52	77.11	74.96	76.42	76.42	76.68
Per cent by w't of hydrogen	21.86	23.31	23.23	23.48	22.89	25.04	23.58	23.52	23.32
B. T. U. per cu. ft	1,287	1,128	1,163	1,115	1,252	1,044	1,085	1,069	1,037

Analyses of Trenton limestone gas, made by Prof. C. C. Howard.

	Fostoria, Ohio	Findlay, Ohio	St. Marys, Ohio	Muncie, Ind.	Anderson, Ind.	Kokomo, Ind.	Marion, Ind.
Hydrogen	1.89	1.64	1.74	3.25	1.86	1.42	1.20
Methane (marsh gas)	92.84	93.35	93.85	92.67	93.07	94.16	93.58
Olefiant	0.20	0.35	0.20	0.25	0.49	0.30	0.15
Carbon monoxide	0.55	0.41	0.44	0.45	0.73	0.55	0.60
Carbonic acid	0.20	0.25	0.23	0.25	0.26	0.29	0.30
Oxygen	0.35	0.39	0.35	0.35	0.40	0.30	0.55
Nitrogen	3.82	3.41	2.98	3.53	3.02	2.80	3.42
Hydrogen sulphide	0.15	0.20	0.21	0.15	0.15	0.18	0.20
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Analysis of West Virginia gas, made by Mr. Forrest M. Towl.

	Parkersburg	Wetzel County
Carbon dioxide	0.7	0.2
Illuminants	0.7	0.6
Petroleum vapors	1.5	0.0
Oxygen	1.8	0.5
Nitrogen	0.0	0.1
Paraffines	95.3	98.6
	100.0	100.0
Specific gravity	0.70	0.674
B. T. U. per cu. ft.	1,153	1,141

Combustion.—It will be observed that few attempts have been made to separate the hydrocarbons. The process is very difficult and unsatisfactory and as the chief and only use of gas is for fuel, the principal point to be considered is its heating power. (Its use as an illuminant is limited to the application of incandescent mantels, where the light is dependent on the heating power of the gas.) This subject has been very carefully considered by many of the best chemists and physicists, notably Prof. C. C. Howard, of Ohio; Mr. Robert Young and Prof. F. C. Phillips, in Pennsylvania; Forrest M. Towl, and many others. The difference in their results are due mostly to differences in methods of analysis. For all practical purposes the following rule will give British Thermal Units (B. T. U.) per cubic foot: B. T. U.=per cent. of hydrocarbons × specific gravity of gas × 18.3.

This formula is only a rough approximation, but gives a result slightly too small with gas of low specific gravity and correspondingly higher with the heaviest gases.

The products of the combustion of hydrocarbons vary in proportion to the amount of oxygen available for the combustion. If sufficient oxygen is supplied, the resultant products are steam (H O)

and carbonic acid gas (CO_2). If the supply is insufficient, carbon is burned to carbon monoxide (CO) with a loss of more than one-half of the heat units in the carbon. If the amount of oxygen is still less, the hydrogen will burn to steam and the carbon be deposited as soot, and in the last named case nearly one-half of the heat units of the gas will be lost.

To burn marsh gas in oxygen, the formula is:

$$CH+2O=CO+2H_2O$$

or 1 cubic foot of marsh gas requires 2 cubic feet of oxygen to burn it, the results produced being 1 cubic foot of carbonic acid gas and 2 cubic feet of steam.

To burn ethane, the chemical formula is:

$$2C_2H+7O=4CO+6H_2O$$

or 2 cubic feet of ethane require 7 cubic feet of oxygen to consume it. Since the source of oxygen commonly used in combustion is the air, of which but 21 per cent. by volume is oxygen and 79 per cent. is innate nitrogen, about 5 cubic feet of air is necessary to furnish 1 cubic foot of oxygen, or approximately 10 parts by volume of air are necessary to burn one of methane and 17.5 parts to burn one of ethane.

As an example in combustion, suppose it is desired to burn gas under boilers for making steam, the composition of the gas being 95 per cent paraffines, of which 25 per cent. is ethane and 70 per cent. methane. Suppose the stack temperature to be 400°F. and the temperature of the air 60°F. There would be available in 1 cubic foot of this gas:

Methane, 70 per cent. of 1,064=744.8 B. T. U.
Ethane, 25 per cent. of 1,863=465.6 B. T. U.

Total, 1,210.4 B. T. U.

To burn this gas would require of air:
70 per cent. of 10 cu. ft.=7 cu. ft.
25 per cent. of 17.5 cu. ft.=4.4 cu. ft.

Total, 11.4 cu. ft.

This would weigh 11.4×0.08071 (weight of 1 cu. ft. of air)=0.92 lb. To this must be added the weight of 1 cubic foot of the gas, or about 0.056, making 0.976 lb., or in addition to the work done in evaporating water in the boiler, each cubic foot of gas must raise 0.976 lb. of the gaseous products of combustion from 60°F. to 400°F. or through 340°F. Since the average specific heat of the products of combustion is about 0.24, this work will consume

$$0.976\times0.24\times340=79.6 \text{ B. T. U.}$$

Subtracting this amount from the heat units in a cubic foot of gas, we have 1,210.4—79.6=1,130 B. T. U. still available for evaporating water. If the temperature of the feed water be 80°F., it will take 212—80=132 B. T. U. to raise the temperature of 1 pound of water to the boiling point and, since 965.7 B. T. U. are necessary to convert 1 pound of water at 212°F. into steam of the same temperature, there will be necessary 965.7+132=1,097.7 B. T. U. to convert 1 pound of water 80°F. into steam at 212°F., or the heat of 1 cubic foot of gas would be sufficient to evaporate 1,130.8÷1,097.7=1.03 lb. of water from 80°F. to steam at 212°F. If the water was at 212°F. in the beginning, 1 cubic foot of gas would convert 1,130.8÷965.7=1.17 lb.

Of course in practice considerable heat is lost by radiation and other causes, and the above mentioned conditions are not realized. However, in a number of instances one pound of water has been evaporated from a temperature of 212 degrees F. for each cubic foot of gas consumed. In December, 1900, at Tarport, Pa., one cubic foot of gas with Klein burners evaporated 1.15 pounds of water under 80 horse power boilers.

USES OF NATURAL GAS.

Natural gas is most valuable as a domestic fuel. For heating dwellings it is the ideal fuel, being perfectly clean, without dust or soot, operated without labor, and with a thermostat connection for regulating the feed of gas by the temperature of the room it operates from week to week without attention and without any variation in the temperature of the apartment. For cooking it is unsurpassable. Besides being cleanly, it makes an extremely hot fire, is always at hand in a moment, and can be extinguished immediately when not needed. It permits the kitchen to be cool and clean, and with an oven thermometer, the baking temperature can be controlled to a single degree. In roasting and broiling a quick hot fire over the meat sears the outside and results in a sweeter, more juicy and heavier roast than is possible by any other means.

With reference to economy, natural gas at 25 cents per 1,000 cubic feet is as cheap for domestic heating and cooking as anthracite coal at $5.50 per ton.

For manufacturing purposes it is probably most valuable in the manufacture of glass where its advantages are the reduction in labor in caring for furnaces; the improved quality of the product, due to the freedom from dust or soot to discolor it, and the longer life of the furnaces.

In the heating and melting of iron and steel, there is less wear on the furnaces and smaller furnaces can be used for the same output than is possible with coal. It is economical and advantageous to use natural gas in annealing furnaces, tool heating and welding furnaces, coke ovens, heating furnaces where blasts are used, and in all kinds of gas generating furnaces for heating and melting purposes.

In burning brick a better color can be obtained and a better output from the kiln, because the fire is regulated more quickly and easily than with coal. In fact, natural gas is useful for nearly all purposes where coal may be used, except in the reduction of iron ore, where its composition and gaseous nature preclude its use.

Burned under boilers, with the most economic burners, natural gas at 10 cents per 1,000 feet is about as

economic as coal at $1.80 per ton, even though the coal be burned in the most economic manner with mechanical stokers.

AIR IN THE GAS MAINS.

It has become such a common cry among consumers of natural gas that the company from which they secure their supply is pumping air into their main, when the gas pressure is low, that some attention should be given the subject. And the most peculiar feature of this charge is that men of ordinary common sense and many with a rudimentary education in chemistry make these charges. If firms supplying natural gas were to pump air into their mains they would within 24 hours asphyxiate or blow up seven-eighths of their consumers and the consequent damage suits would ruin such a concern beyond all hope for recovery.

The simplest illustration to show that air cannot be forced through a gas main and made to light, even for an instant, is that of a new installation in a building. After the plumber or pipe fitter completes his work and the gas pressure is permitted to enter the pipes any attempts at lighting a burner will be frustrated. A pressure of air will be forced from the pipe sometimes strong enough to blow out a lighted match, but it will not burn. This is because the pipes are filled with air, nitrogen, oxygen, carbon dioxide and a cer tain amount of vapor. This will not burn, although it is necessary to aid combustion of gas and other inflammable substances. What results in a new pipe or where air fills a pipe would also result if a pressure of air was forced into a gas main to force the gas more quickly through the mains or to enrich the gas, or even to make a gas meter work more rapidly, as the charge is frequently made.

It has been maintained that the air pressure forced into the main assimilates with the gas and impoverishes it. If this is true, why did not the air in the gas pipe left there after the plumber or pipe fitter has completed his work assimilate with the gas? That it does not every one has observed who has ever tried to light a burner at the end of a newly laid pipe.

Many companies supplying natural gas maintain large pumping stations along their mains between the gas wells and the point of consumption. These are located in isolated places usually, and the public merely learns that such pumping stations are maintained, but few attempts are made to investigate the working of these pumps and why they are necessary. When natural gas was first made use of as a fuel it was wasted in every possible manner. Within a few years the pressure from nature's stoarge tanks began to diminish. There was still plenty of gas within the bowels of the earth, but it could not issue forth in sufficient volume to supply the demand. What more natural than to have pumps erected and pump it out of the earth to consumers? This is exactly what is being done.

Some cities have rivers passing through their confines, others have lakes nearby from which the water supply is secured. The water does not run into the homes of citizens. It is pumped into reservoirs or stand pipes, or it is pumped direct in some places to the consumer. Do the pumps supply air instead of water? Not any more than the natural amount that mingles with the water in its passage. The pumping of natural gas is exactly the same proposition. The only air that is mixed with the gas is that which comes from the gas mixer below, and every one who has given the subject any attention knows that gas will ascend above the air because it is lighter, volume for volume.

If air was pumped into the gas mains the people would have a gust of air, then a small supply of gas between the strokes of the pump. It would require a continuous igniter at the place of burning to start a blaze every time the rush of air extinguished the blaze. The truth is, that some gas is so poor that it will not develop the proper heat. In most cases, however, the ignorance of the plumber and the consumer is to blame. They do not know how to regulate the air pressure through the mixer, believing that one mixer will do for all sorts of gas and pressure. A special mixer is necessary for each mixture of gas and it requires some little attention to regulate the amount. Gas burners have been noticed with large quantities of black carbon hanging about and the complaint is heard that the gas is poor is mixed with air so as to hurry the gas meter and enrich the corporation. The very carbon hanging about in profusion is evidence that the gas and air are not mixed properly for the burning and the fault lies with the consumer.

When the gas is burning and it forms carbon or lamp black commonly called soot in the grate or stove or on the bottoms of the cooking utensils the fault lies in the air mixer, in not supplying enough air to the burner. When the blaze or fire is light blue in color and does not make the required heat the fault lies in the air mixer supplying too much air to the burner. The heating qualities of the gas should be regulated by the air mixer. The blaze to give the proper heat and be free from soot, dust or smoke should be of a blue turning to a dark straw color.

GAS METERS.

These were adopted for general use by all the natural gas companies owing to the consumers' abuse of the abundant supply of gas at a fixed low monthly rate for stoves, grates, jets and street lights. While it is true the consumers were given an abundance of gas at very low rates and most of the gas companies furnished their consumers with natural gas at one-tenth the cost of coal, coke or wood (not to mention the inconvenience of burning coal, coke and wood, as compared with burning natural gas, which requires no attention whatever) and was supplied nine times cheaper than coal, coke and wood, with all of its inconvenience of irregular heat and the annoyance of kindling the fire and carrying out the ashes. Notwithstanding the fact the gas required no kindling, there is no ashes or dirt to carry out, and at so small a cost was the gas that no person was too poor to burn it. However, the consumers did not appreciate it. Any person visiting a city or town that was supplied

with natural gas up to and within the past eight years would see everywhere an abundance of gas lights—in the streets, houses, stores, hotels, livery stables, everywhere; and curiously enough they would leave their jets burning night and day. Street lights were blazing away at noon as well as at midnight. On hot summer days it was a common sight to see open gas jets burning in stores, shop windows, in houses with the doors and windows open, and in the dining rooms of hotels, with fans going to keep cool. The abuse and willful waste of gas was carried to such an extent that a great number of consumers during the coldest days in the winter would turn on all the gas their stoves, grates and jets would consume, which would soon overheat their house or store, and instead of turning down the gas they would open the doors and windows. A number of the consumers were asked why they did not turn down the gas instead of wasting it. Their reply was "to get even with the gas company."

"But how do you injure the company by making yourselves uncomfortable?"

"Oh, just waste the gas and make the company drill more wells."

While it is true the gas companies were compelled to drill a few more wells, but is it not a fact that thousands of new houses, pianos and fine furniture were ruined by overheating the houses in an endeavor to waste the company's gas? "The greed of a few has become the burden of the many," as all of the leading gas companies of the present day require their consumers to burn their gas by meters at a much higher rate and a great saving to the gas over the old way. Since the consumers burn their gas by meter they must pay for every 1,000 feet of gas used. This has taught the consumers the virtue of economy.

THE LARGEST GAS WELL EVER STRUCK IN THE WORLD.

History and Record of the Big Moses Gas Well.

Moses Spencer farm well No. 1, Indian creek, Tyler county W. Va.; Victor Oil and Gas Company, of Pittsburg, Pa., Wilson Brothers, Bolivar, N. Y., and George Earnest, of Sistersville, W. Va., owners of one-third each in the well.

Drilling began August 3, 1894. Conductor 14 feet, 10-inch casing 158 feet, 8¼-inch casing 1,050 feet, coal 740 to 744 feet, Cow run sand 800 to 820 feet, salt sand 1,200 to 1,290 feet, Keener sand 1,710 feet, Big Injun sand 1,750 feet. Gas was struck September 3, 1894. Well was shut down to move the boiler back. Two days were required to haul the pipe and connections from Sistersville and move the boiler back to a safe distance from the well. On September 5 drilling was again resumed, but the gas began to come so strong that the contractor, Mr. Wilson, told the drillers to pull the tools out and wait a few days to see if the gas would not blow out. The next morning, September 6, the well drilled itself in and the gas came so strong that it raised the crown block on the top of the derrick, with a 38 foot 4½ stem a big hole set of jars and rope socket and a new 8¼ bit hanging on it. When the well first drilled itself in nothing could be seen of the derrick but a cloud of sand and dust. The roaring noise of the well was heard for a distance of 10 miles. The gas well was let blow in the open air until November 28, 1894. In the meantime the Victor Oil and Gas Company, Wilson Brothers and George Earnest sold the gas right to the Philadelphia Gas Company. The Philadelphia Gas Company awarded the contract to a man by the name of Matheny to shut the well in for $1,000. The man Matheny ordered one 10-inch Y and two 10-inch gate valves that were billed at 4,000 pounds each and failed to appear at the well after taking the contract and ordering the material. A 10-inch gas line was laid to the well, which was the extreme end of the Philadelphia company's 16-inch gas line in West Virginia. After the material had arrived at the well and the man Matheny failed to appear the contractor, Mr. Wilson, sent George McCutchen and J. N. Curry to work and they poured eight barrels of cement in between the 8¼-inch and 10-inch casing, dug a hole eight feet square around the casing down to the rock 14 feet deep and filled the hole within eight feet of the top with concrete. They anchored two large oak timbers with four large bolts 12 feet long bolted through the timbers and filled the hole to the top with concrete. They put the Y and the two gate valves on to the 10-inch casing, fastened them to a set of clamps that they bolted down with the four bolts bolted to the two timbers that were anchored in the concrete, closed the gate valves and shut the well in on the 28th of November, 1894. The well blowed through the 8¼-inch casing two months and 25 days and had an open pressure of 575 pounds and everything seemed in the best of order until the first of February, 1895, the pressure broke out through the 8¼ and 10-inch casing and came out through the ground, making a number of holes large enough to bury a team of horses, wagon and teamster, for a distance of a fourth of a mile around the well. The gate valves were opened February 7 and the well was allowed to blow in the open air until the first of April, when the gate valves were taken off and they started to put in 6¼-inch casing, with a packer on the bottom joint. They had to pull 25 joints in the hole with block and tackle after putting in 1,600 feet of the 6¼-inch casing the pressure of the gas unscrewed the casing near the top of the hole and dropped it.

While fishing for the casing lightning set the gas on fire June 14 and burned for one hour. The fire only burned part of the derrick and the end off of the walking beam. The pressure of the gas blew the fire out. The derrick was rebuilt and the men fished for the dropped casing, and on July 27 the gas again caught fire from lightning and burned the derrick and everything up. The gas burned 180 feet high until August 12, when they put the fire out with 8¼ and 10-inch tee bell socket with two joints of 8¼-inch casing 40 feet in length screwed in both ends of the tee.

As an illustration to the reader of the voluminous

pressure of the well an ordinary boiler steam gauge with ¼-inch connections was held at the edge of the casing and registered 45 pounds. The empty cement barrels were thrown over the hole and blown up in the air from 100 to 300 feet. They looked like balloons before the barrels would break. It was impossible to hold any small thing over the hole, the pressure was so great that it would break, bend or blow away anything that would come in contact with the hole. The derrick was again rebuilt and the casing fished out down to 1,150 feet and another string of 6¼-inch casing with a packer on lower joint was put in the hole and the well was shut in again on August 27, 1895, and had a pressure then of 450 pounds. The well was only one location north of the oil belt after Kyle No. 1 was struck and a great deal of drilling was done around the Big Moses gas well. The flowing wells soon took the gas pressure off of the sand and the Big Moses gas well soon weakened and all that is left of it today is the casing sticking up out of the ground. The Philadelphia Gas Company abandoned the well and moved the rig away. Drillers, George McCutchen and J. G. McElhattan; tool dressers, J. N. Curry and Jos. Smith; L. C. Wilson, contractor; record and history by L. C. Wilson and J. N. Curry.

Estimated production of well, 100,000,000 cubic feet of gas each 24 hours open flow through 8¼-inch casing under 575 pounds open pressure.

LARGEST NATURAL GAS PUMP STATION IN THE WORLD.

This is at Hastings station on the West Virginia Short Line railroad one and a half miles southeast of Pine Grove, Wetzel county, W. Va., pump station of the Hope Natural Gas Company. Main building 50 by 224 feet, 22 feet in height this building is to cover four pumps of 1,200 horse power each the combined horse power of the four pumps is 4,800, the largest gas pumps in the world. Only two pumps will be used at the present time. The electrical building is 30 by 144 feet; it is used for the office, gas engine and electric plant. A 15 horse power gas engine is used in this building to furnish power for the electric generators. The third building is 30 by 60 feet and is used as the machine and pipe shops. A 30 horse power gas engine is used in this building for power. The fourth building is 20 by 30 feet and is used as the gas meter house. The large pumps are run by gas power and are used to pump the gas from the wells at a low pressure and raise it to a high pressure of 600 pounds. In this method the gas transports itself from 10 to 200 miles away from the wells to the consumers. The gas lines from the wells to the pump station are 8 and 10-inch screw joints. Three 12-inch screw joint lines are laid from the pump station over a hill that has a rise of 500 feet and about two miles from the pump station, then two of the 12-inch lines are coupled to one 18-inch line; then two lines, one 12-inch and one 18-inch, run to the Ohio river, where seven 10-inch screw joint lines cross the Ohio river. Then one 12-inch and one 18-inch line with patent couplings run to Cleveland, Ohio; then one 12-inch line from Cleveland to Toledo, Ohio, where it connects with the line that supplies, Toledo, North Baltimore, Findlay, Lima and other towns in northwestern Ohio and a number of cities and towns in Indiana. This is not only the largest and finest natural gas pump station in the world but it is the most costly one. Glenn T. Braden, general manager; Dennie Hastings, superintendent.

NATURAL GAS CONSUMED IN THE UNITED STATES—1889-1901.

The consumption of natural gas has continued to increase, although the pressure, except in the new fields in West Virginia, has continued to decline, necessitating the expense of compression in order to market an increased production from the declining fields, which expense must continue to increase as the pressure declines and the distance to the source of supply increases.

During the year 1901 there was an unusual amount of consolidation of the older companies, and there were organized also a number of new companies with large capital, with a view chiefly of utilizing the great areas of high pressure gas territory in Lewis, Harrison, Marion and Wetzel counties of West Virginia by the construction of larger and longer pipe lines, so as to market this increased production in western Pennsylvania and Ohio. This involves the outlay of many millions of capital.

Natural gas is a luxury in the household which when once acquired is most difficult to dispense with. Consumers who have learned to know its value and convenience are very loath to part with it, and even under the penalty of additional compensation to the producer they prefer to retain it rather than go back to the grosser methods of heating by the use of wood or coal. In fact, outside of the areas supplied by natural gas the consumption of manufactured gas in the household has increased, although the substitutes offered are vastly inferior to natural gas in heating power and are at least double in cost per thousand feet.

These are the facts that have stimulated capitalists to invest the money necessary to develop the reservoirs of the natural gas fields that are still holding their original pressure and volume. These capitalists are building hundreds of miles of larger lines in order to supply the towns and cities formerly supplied by nearer but now exhausted fields, and also to supply other cities that have never known the blessings of natural gas.

As a source of heat, light and power, natural gas is unexcelled from the moment it reaches the surface of the earth at the mouth of the well until it reaches the farthest consumer at the end of the pipe line. No preparation is necessary for its combustion, and no residue is left. It needs only to be mixed with the proper amount of air and to have the combustion started by a naked flame or by an electric spark, when it will ap-

propriate to itself the proper amount of oxygen. As a source of heat it is unrivaled in the household, as it is also in the workshop in the generation of steam and in varied metallurgical operations; and as a source of light, even in its crude state, it will in many cases give a fair illumination, which is much improved by the use of an argand burner and chimney . However, it remained for the Welsbach mantle, now in such general use throughout the area supplied by natural gas, to produce from natural gas the most perfect and economical of lights.

As a source of power it stands at the head of the list for economy, both as to expense of installation and expense of operation. The natural gas engine is used most extensively in the petroleum fields for pumping the petroleum to the surface in the thousands of small producing wells. In very many instances the flow of natural gas from the upper strata, above the petroleum producing rock in the well is sufficient to supply a gas engine to pump a cluster of from six to thirty wells.

It has been supplying power for a very large number of factories and operations in the gas belt; and lately it has been extensively applied in creating the power by which the natural gas itself is compressed from a low pressure to a high pressure when the original pressure has failed and the pipes are insufficient to deliver the necessary quantity of gas at the well pressure. A number of these compressors work up very close to 1,000 horse power with an economy that enables eight to 10 cubic feet of natural gas to develop a horse power for an hour, a saving of from 40 to 50 per cent over high duty steam engines.

The state of West Virginia has for several years furnished an increasing quantity of natural gas to Pennsylvania and Ohio; yet there still remain under the domes and arches of its rugged hills great reservoirs of it that have only been sufficiently tested by the drill to prove their existence.

These reservoirs are being connected by additional lines of large pipe, and will shortly supply larger quantities to localities in these states that have exhausted their own nearer reservoirs, and now turn to West Virginia for a continuation of their supply.

The value of the natural gas sold in 1901 was greater than that of any previous year, though the quantity was greatly exceeded when it was first introduced extensively from about 1883 to the close of 1889. During this period of six years it was used in the most extravagant and reckless manner, and it was paid for at rates that were in many instances less than one-half the price of the equivalent of coal. Large quantities were allowed to escape and burn from the mouths of the hundreds of stand pipes from Saturday afternoon until Monday morning. It is highly probable that in these six years of reckless consumption four times the present production was consumed annually.

As the visible supply grew less the value became more apparent, and the appliances for consuming the gas became greatly improved after the introduction of the meter. The pipe line companies greatly improved their methods in securing better joints, in shutting off wells that were not needed to keep up the pressure in the mains, and in manipulating the wells themselves. By the extension of lines into newer territory they have been enabled to market increasing quantities at increased prices since the years 1895 and 1896, in each of which years only $13,000,000 worth of gas was sold.

The value of the natural gas consumed in the United States in 1901 was $27,067,000, which, at 15 cents per 1,000 cubic feet, is equivalent to 180,450,000,000 cubic feet. If it were possible to store this gas in a cube, the density throughout being equal, its sides would be 5,530 feet in length, or 250 feet greater than the sides of a cubic mile. If 20,000 cubic feet of natural gas be taken to equal one ton of coal, 8,458,600 tons of coal, valued at $3.20 per ton would be required to yield the sum of money for which the natural gas sold.

The value of the production for 1901 was greater than that of 1900 by $3,368,826, or over 14 per cent. It also exceeded that of 1899 by $6,992,627. It may also be interesting to note that the value of the 69,389,194 barrels of petroleum produced in the United States during 1901 was $66,417,335, and that the value of the natural gas amounted to 40.7 per cent of the value of the petroleum for the same year, and that, further, when the fuel value of coal and wood displaced by natural gas in 1901—which amounts to $32,445,156—is considered, this estimated value of natural gas is nearly 49 per cent of the entire value of the crude petroleum produced in the same year.

There were 11,297 wells producing natural gas at the close of 1901, of which number 74 were not turned into the gas mains, and 2,088 producing wells were drilled in the same year; there were 453 dry holes, or nonproducers, and 1,084 were abandoned. In 1900 there were 10,293 producing wells, of which number 24 were shut in; 1,759 wells were drilled in the same year; 359 were dry holes, and 991 were abandoned. There were very nearly 800 miles of pipe laid during 1901, the mains varying from two inches up to 20 inches. This brought the total up to 21,848 miles of natural gas mains of from two inches to 36 inches in diameter in use at the close of 1901.

COMPRESSION OF NATURAL GAS.

The following table for ascertaining the compression of natural gas under different gauge pressures is calculated on a pressure of four ounces to the square inch, the usual pressure at which it is marketed by many of the natural gas companies. The atmospheric pressure is assumed to be 14.4 pounds to the square inch, and the temperature at which the table is calculated is 60 degrees F. The quantity for any pressure greater than four ounces, or one-fourth of a pound up to a pressure of 136 pounds can be found by multiplying the reading of the meter by the figures opposite the pressure observed. The table contains the multipliers to be used in measuring the gas under pressures greater than four ounces to the square inch.

Multipliers to be used for natural gas which is measured at pressures greater than four ounces per square inch, atmospheric pressure being taken at 14.4 pounds per square inch.

Gage pressure	Multiplier or Density	Gage pressure	Multiplier or density	Gage pressure	Multiplier or density	Gage pressure	Multiplier or density	Gage pressure	Multiplier or density
Pounds per sq. in.		Pounds per sq. in.		Ponnds per sq. in.		Pounds per sq. in.		Pounds per sq. in.	
0	0.98294	24	2.66118	48½	4.29365	73	5.96576	97½	7.63883
¼	1.00000	24½	2.65531	49	4.32778	73½	5.99989	98	7.67296
½	1.01706	25	2.68944	49½	4.36191	74	6.03402	98½	7.70709
1	1 05119	25½	2.72357	50	4.39604	74½	6.06815	99	7.74122
1½	1.08532	26	2.75770	50½	4.43017	75	6.10228	99½	7.77535
2	1.11945	26½	2.79183	51	4.46424	75½	6.13641	100	7.80948
2½	1.15358	27	2.82596	51½	4.49834	76	6.17054	100½	7.84361
3	1.18771	27½	2.86009	52	4.53250	76½	6.20467	101	7.87774
3½	1.22184	28	2.89422	52½	4.56663	77	6.23880	101½	7.91187
4	1.25597	28½	2.92835	53	4.60076	77½	6.27293	102	7.94600
4½	1.29010	29	2.96248	53½	4.63489	78	6.30706	102½	7.98013
5	1.32423	29½	2.99661	54	4.66902	78½	6.34119	103	8.01426
5½	1.35836	30	3.03074	54½	4.70315	79	6.37532	103½	8.04839
6	1.39249	30½	3.06487	55	4.73728	79½	6.40945	104	8.08252
6½	1.42662	31	3.09900	55½	4.77141	80	6.44358	105	8.15078
7	1.46075	31½	3.13313	56	4.80554	80½	6.47761	106	8.21904
7½	1.49488	32	3.16726	56½	4.83967	81	6.51174	107	8.28730
8	1.52901	32½	3.20139	57	4.87380	81½	6.54587	108	8.35556
8½	1.56315	33	3.23552	57½	4.90793	82	6.58000	109	8.42382
9	1.59728	33½	3.26965	58	4.94206	82½	6.61503	110	8.49208
9½	1.63141	34	3.30378	58½	4.97619	83	6.64916	111	8.56034
10	1.66554	34½	3.33791	59	5.01032	83½	6.68329	112	8.62860
10½	1.69967	35	3.37204	59½	5.04445	84	6.71732	113	8.69686
11	1.73380	35½	3.40617	60	5.07858	84½	6.75145	114	8.76512
11½	1.76793	36	3.44030	60½	5.11271	85	6.78558	115	8.83338
12	1.80206	36½	3.47443	61	5.14684	85½	6.81971	116	8.90164
12½	1.83619	37	3.50856	61½	5.18097	86	6.85384	117	8.96990
13	1.87032	37½	3.54926	62	5.21510	86½	6.88797	118	9.03816
13½	1.90445	38	3.57682	62½	5.24913	87	6.92210	119	9.10624
14	1.93858	38½	3.61095	63	5.28326	87½	6.95623	120	9.17468
14½	1.97371	39	3.64508	63½	5.31739	88	6.99036	121	9.24294
15	2.00684	39½	3.67921	64	5.35152	88½	7.02449	122	9.31120
15½	2.04097	40	3.71334	64½	5.38565	89	7.05862	123	9.37946
16	2.07510	40½	3.74747	65	5.41978	89½	7.09275	124	9.44772
16½	2.10923	41	3.78160	65½	5.45391	90	7.12788	125	9.51598
17	2.14336	41½	3.81573	66	5.48804	90½	7.16101	126	9.58424
17½	2.17749	42	3.84986	66½	5.52217	91	7.19514	127	9.65250
18	2.21162	42½	3.88399	67	5.55630	91½	7.22927	128	9.72076
18½	2.24575	43	3.91812	67½	5.59043	92	7.26340	129	9.78902
19	2.27988	43½	3.95225	68	5.62456	92½	7.29753	130	9.85728
19½	2.31401	44	3.98638	68½	5.65869	93	7.33166	131	9.92554
20	2.34814	44½	4.02051	69	5.69282	93½	7.36579	132	9.99380
20½	2.38227	45	4.05464	69½	5.72695	94	7.39992	133	10.06206
21	2.41640	45½	4.08887	70	5.76108	94½	7.43405	134	10.13032
21½	2.45053	46	4.12300	70½	5.79512	95	7.46818	135	10.19858
22	2.48466	46½	4.15713	71	5.82934	95½	7.50231	136	10.26680
22½	2.51879	47	4.19126	71½	5.86347	96	7.53644	.....	.....
23	2.55292	47½	4.22539	72	5.89750	96½	7.57057	.....	.....
23½	2.58705	48	4.25952	72½	5.93163	97	7.60470	.....	.....



HOPE NATURAL GAS PUMP STATION (THE LARGEST NATURAL GAS PUMP STATION IN THE WORLD

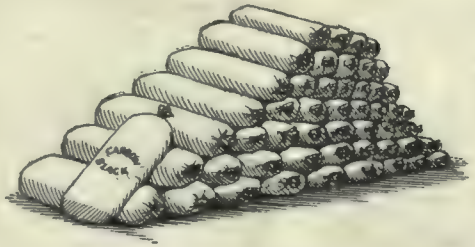


TAKING UP NATURAL GAS LINE

(NEAR) OIL CITY, PA.



NATURAL GAS LOGS, GRATES, STOVES AND RANGES.

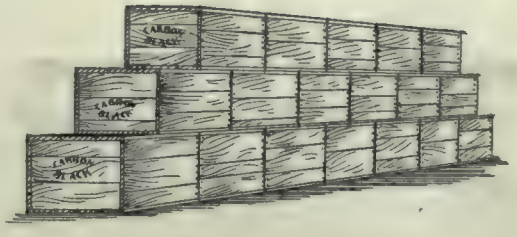






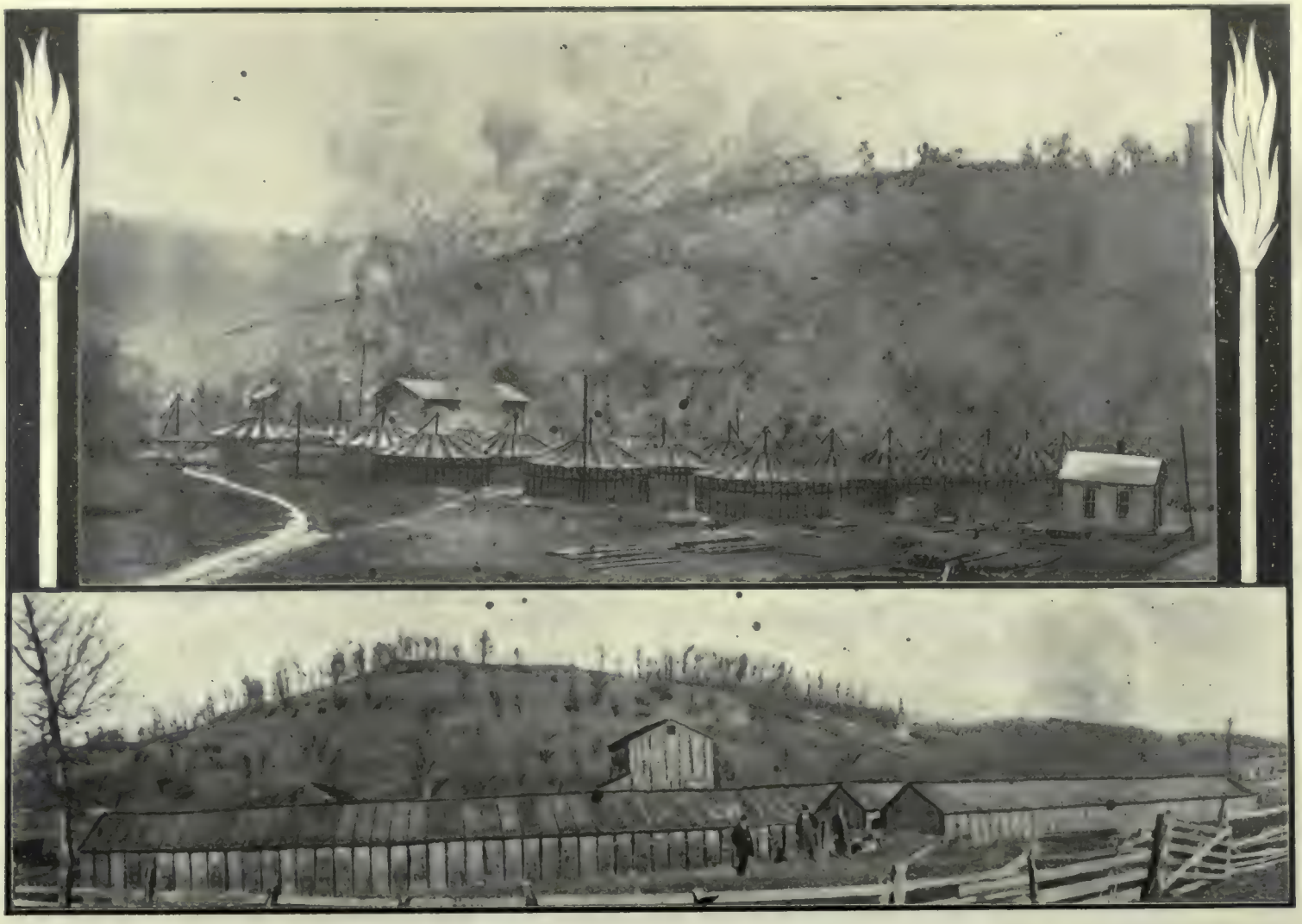
AMERICAN CARBON BLACK CO.

WESTON, W. VA.



WESTON CARBON BLACK CO.

NEAR WESTON, W. VA.

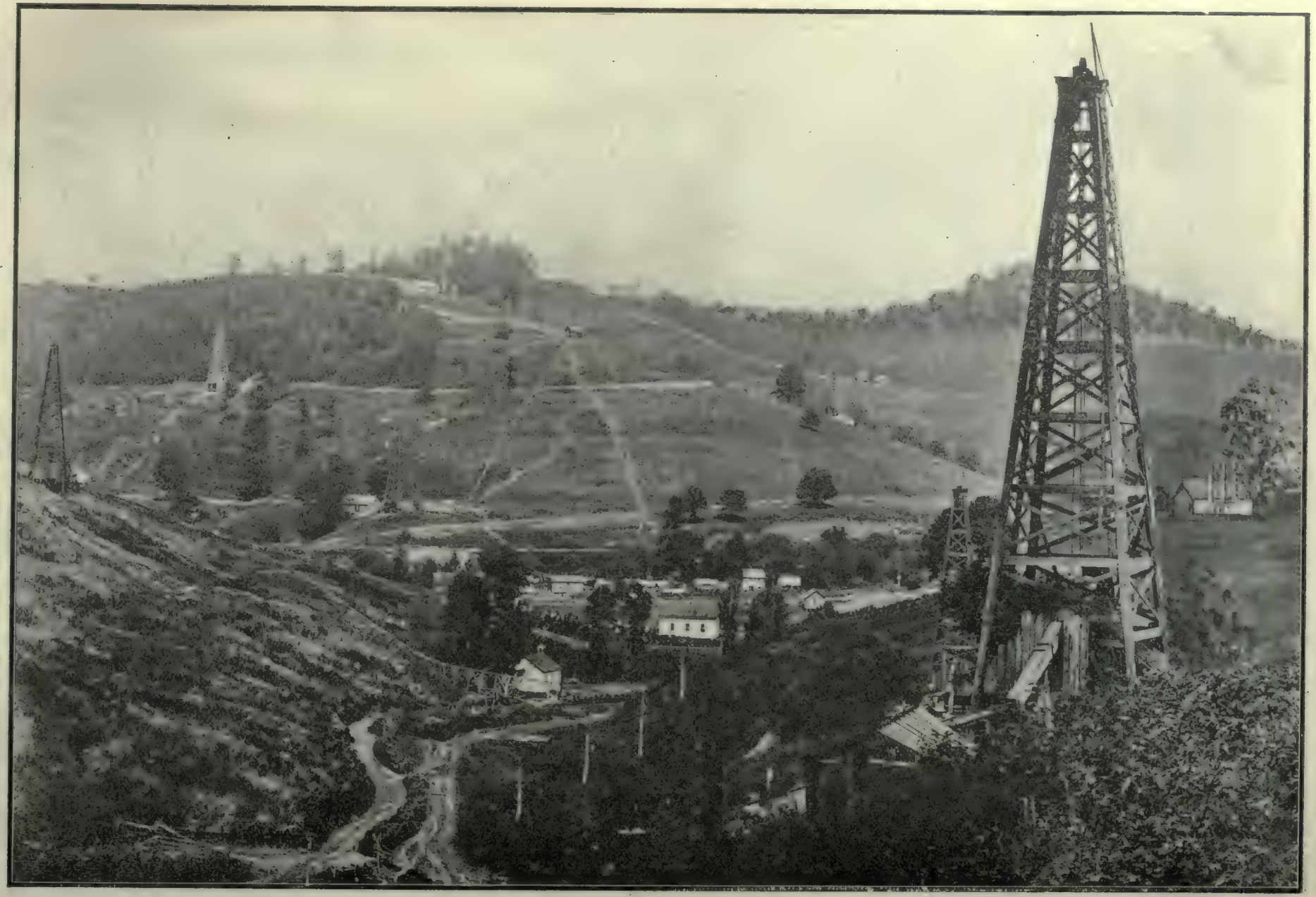


CABOT CARBON BLACK FACTORY

NEAR GRANTSVILLE, W. VA. (LARGEST IN THE WORLD)

COLUMBIA CARBON BLACK CO.

NEAR WESTON, W. VA.



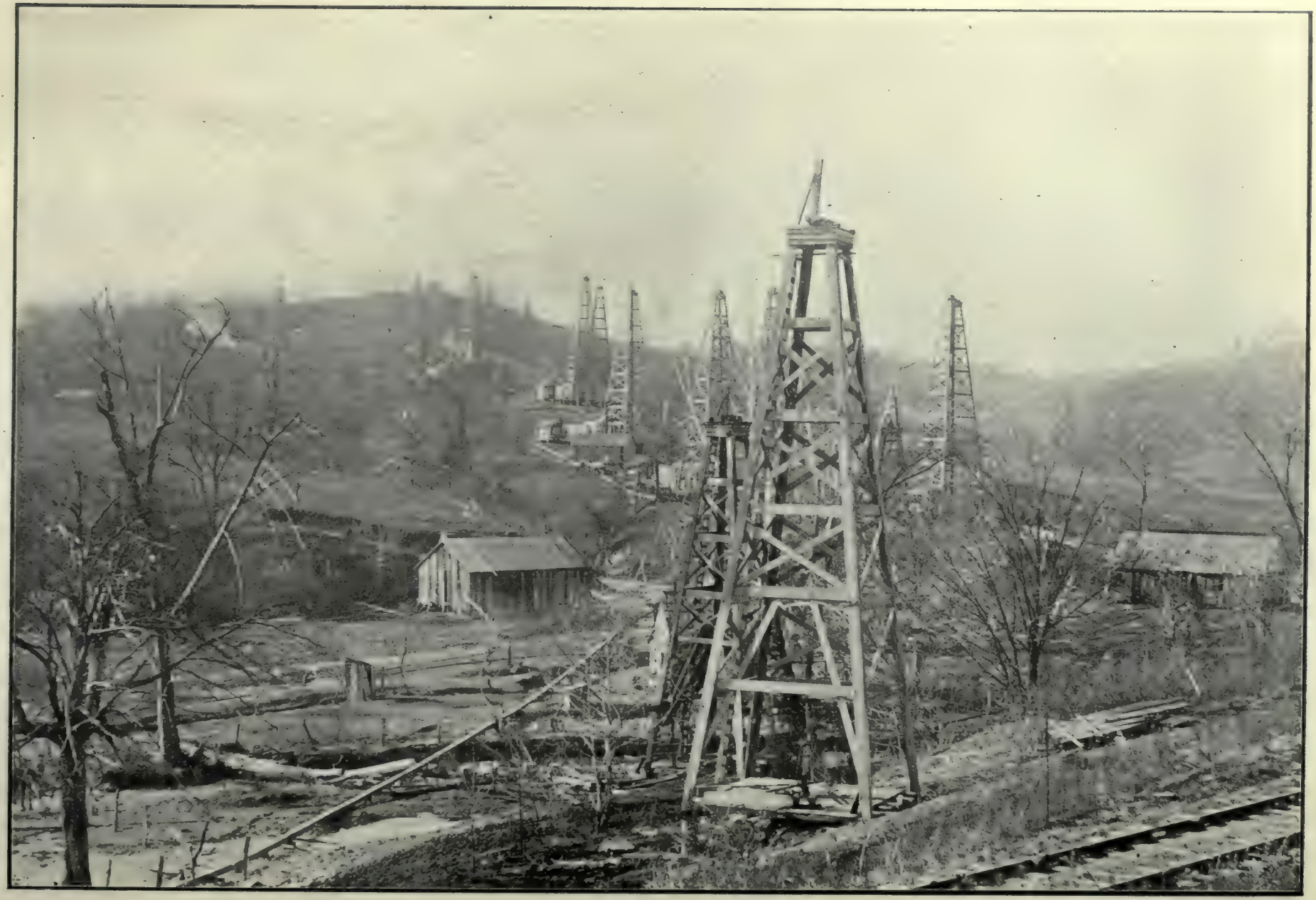
LYNCH FARM—WOLF SUMMIT OIL FIELD.

LYNCHBURG, W. VA.



LYNCH AND GOFF FARMS

(Wolf Summit Oil Field.) Lynchburg, W. Va.



MOORE OIL FIELD

MARIETTA, O.

VALUE OF NATURAL GAS PRODUCTION.

In the following table is given the approximate valueof natural gas produced in the United States from 1889 to 1901, by states:

Approximate value of natural gas produced in the United States from 1889 to 1901, inclusive, by states.

STATE.	1889	1890	1891	1892	1893	1894	1895
Arkansas	$375	$6,000	$250	$100	$100	$100	$100
California	12,680	33,000	30,000	55,000	62,000	60,350	55,000
Colorado	.....	.....	.....	.....	.....	12,000	7,000
Illinois	10,615	6,000	6,000	12,988	14,000	15,000	7,500
Indiana	2,075,702	2,302,500	3,942,500	4,716,000	5,718,000	5,437,000	5,203,200
Kansas	15,873	12,000	5,500	40,795	50,000	86,600	112,400
Kentucky	2,580	30,000	38,992	43,175	68,500	89,200	98,700
Missouri	35,687	10,500	1,500	3,775	2,100	4,500	3,500
New York	530,026	552,000	280,000	216,000	210,000	249,000	241,530
Ohio	5,215,669	4,684,300	3,076,325	2,136,000	1,510,000	1,276,100	1,255,700
Pennsylvania	11,593,989	9,551,025	7,884,016	7,376,281	6,488,000	6,279,000	5,852,000
South Dakota	25	.....	.....	.....	.....	.....	.....
Texas	1,728	.....	.....	100	50	50	20
Utah	150	.....	.....	.....	500	500	20,000
West Virginia	12,000	5,400	35,000	500	123,000	395,000	100,000
Other states	1,600,000	1,600,000	250,000	200,000	100,000		
Total	21,107,099	18,792,725	15,500,084	14,800,714	14,346,250	13,934,400	13,006,650

STATE.	1896	1897	1898	1899	1900	1901
Arkansas	$60	$40	.....	.....	.....	.....
California	55,682	50,000	$65,337	$86,891	$79,083	$67,602
Colorado	4,500	4,000	3,300	1,480	1,800	1,800
Illinois	6,375	5,000	2,498	2,067	1,700	1,825
Indiana	5,043,635	5,009,208	5,060,969	6,680,370	7,254,539	6,954,566
Kansas	124,750	105,700	174,640	332,592	356,900	659,173
Kentucky	99,000	90,000	103,133	125,745	286,243	270,871
Missouri	1,500	500	145	290	547	1,328
New York	256,000	200,076	229,078	294,593	335,367	293,232
Ohio	1,172,400	1,171,777	1,488,308	1,866,271	2,178,234	2,147,215
Pennsylvania	5,528,610	6,242,543	6,806,742	8,337,210	10,215,412	12,688,161
South Dakota	.....	.....	.....	3,500	9,817	7,255
Texas	.....	.....	765	8,000	20,000	20,000
Utah	20,000	15,050	7,875	.....	.....	.....
West Virginia	640,000	912,528	1,334,023	2,335,864	2,959,023	3,954,472
Other states	50,000	20,000	20,000	.....	.....	.....
Total	13,002,512	13,826,422	15,296,813	20,074,873	23,698,674	27,067,500

The above table is conspicuous for the value of the natural gas sold during 1901, the increase being $3,368,826, as compared with the value in 1900. This increase is due principally to increased production, the increase in the general price being very slight, and is not due so much to the output from the recently developed fields in southwestern Pennsylvania and central West Virginia as to the enlarging of lines and the installation of gas compressors. It is this that has kept up the quantity marketed in Indiana to about the average of former years, although the rock pressure has very largely decreased. Kansas, however, has increased the value of natural gas marketed both by developing new territory and by exploiting more thoroughly that which was already known. The value of the gas produced in each state is credited to it, although Pennsylvania furnished natural gas to Ohio, New York and West Virginia; West Virginia furnished gas to Pennsylvania and Ohio; Indiana furnished gas to Ohio and Illinois, and Kentucky furnished gas to Ohio and West Virginia. These complications require a careful tabulation of the values, so that each state shall receive its proper credit.

Notwithstanding all the care exercised in the collection and distribution of the statistics, there is a very considerable amount of natural gas consumed of which no account is rendered, as it is used universally in the oil fields for pumping wells, both in the gas engine and under the boilers, for driving gas compressors, for supplying farm houses, and many operations in the field. There are instances, which reach from northern central New York to eastern Illinois, where single

wells supply one or two houses, so that if it were possible to secure a complete return of the value of all the fuel displaced, the figures presented would be increased by at least 10 per cent.

It is estimated that fully 1,000,000 domestic fires are supplied by natural gas, and that 4,000,000 people are furnished with this ideal fuel and light to gladden their homes.

AMOUNT AND VALUE OF NATURAL GAS CONSUMED.

The following table gives the amount of natural gas consumed in each state as reported by 1,545 companies and individuals, and the value of the coal and wood or other fuel displaced by the gas.

There was a considerable increase in the value of the natural gas consumed in Pennsylvania, a slight increase in Ohio, and a large increase in West Virginia and Kansas, as shown in the second column. The third column shows the estimated value of the coal, wood and other fuel displaced, amounting to $32,445,156, which if divided by the 8,458,600 tons of coal, would give an average value of $3.84 per ton instead of $3.20 per ton, the estimated value given on a previous page. This discrepancy is due to the low price received for natural gas in the state of Indiana, which was only about 60 per cent of the value of the fuel displaced. Kansas also shows a much less value for the natural gas than for the fuel displaced.

Value of natural gas consumed in the United States in 1901, *by states, and the value of coal or wood displaced by same, as reported by* 1,545 *persons, firms and corporations.*

STATE.	Companies or individuals reporting	Amount received for sale of gas or value of gas consumed	Estimated value of coal, wood, or other fuel displaced by gas
Pennsylvania	296	$11,785,996	$11,892,070
Indiana	656	6,276,119	10,669,402
Ohio	305	4,119,059	4,448,584
West Virginia	44	2,244,758	2,415,360
New York	114	1,694,925	1,655,942
Kansas	48	659,173	995,350
Kentucky	26	187,660	206,426
California	12	67,602	122,064
Texas	2	20,000	20,000
South Dakota	3	7,255	15,005
Illinois	22	1,825	1,825
Colorado	2	1,800	1,800
Missouri	15	1,328	1,328
Total	1,545	$27,067,500	$32,445,156

In the following table is given the value of natural gas consumed in the United States in 1889, 1900, and 1901, by states.

Value of natural gas consumed in the United States in 1899, 1900 *and* 1901, *by states.*

STATE.	1889	1900	1901
Pennsylvania	$7,926,970	$9,812,615	$11,785,996
Indiana	5,833,370	6,412,307	6,276,119
Ohio	3,207,286	3,823,209	4,119,059
West Virginia	1,310,675	1,530,378	2,244,758
New York	1,236,007	1,456,286	1,694,925
Kansas	332,592	356,900	659,173
Kentucky	125,745	194,032	187,660
California	86,891	79,083	67,602
Texas	8,000	20,000	20,000
South Dakota	3,500	9,817	7,255
Illinois	2,067	1,700	1,825
Colorado	1,480	1,800	1,800
Missouri	290	547	1,328
Total	$20,074,873	$23,698,674	$27,067,500

By comparing this table with the first one, giving the approximate value of the natural gas produced in the several states, it will be noticed that Pennsylvania produced nearly $1,000,000 worth more than was consumed within the state. Indiana, as has been stated, supplied large quantities to Chicago and some to Ohio; West Virginia supplied large quantities of natural gas to Pennsylvania and Ohio, and Kentucky furnished gas to Ohio and West Virginia. This accounts for the rearrangement of the figures whose totals are the same.

USES OF NATURAL GAS.

In the following table are specified the uses to which the natural gas produced in the United States in 1901 was put.

Uses to which natural gas produced in the United States in 1901 *was put, as reported by* 1,545 *persons, firms and corporations.*

STATE	Companies or individuals reporting	Domestic fires supplied	Establishments supplied				
			Iron mills	Steel works	Glass works	Other establishments	Total
Pennsylvania	296	326,912	82	....	80	1,581	1,743
Indiana	656	153,869	11	....	111	2,448	2,570
Ohio	305	49,709	5	1	13	930	949
W. Virginia	44	55,808	2	....	13	251	266
New York	114	95,161	....	....	2	96	98
Kansas	48	10,227	....	....	....	72	72
Kentucky	26	16,420	....	1	....	19	20
California	12	1,438	....	....	....	7	7
Texas	2	180	....	....	....	9	9
S. Dakota	3	93	....	....	....	8	8
Illinois	22	73	....	....	....	.....	.....
Colorado	2	.....	....	....	....	.....	.....
Missouri	15	31	....	....	....	.....	.....
Total	1,545	709,921	100	2	219	5,421	5,742

RECORD OF WELLS AND PIPE LINES BY STATES.

In the following table will be found the number of companies and individuals reporting, the producing wells at the close of 1900 and 1901, the producing wells drilled and the nonproducing or dry holes drilled in 1901, together with the total length of pipe in use at the close of 1901, by states.

Record of wells and amount of pipe line, as reported by 1,545 persons, firms and corporations in 1901, by states.

STATE	Companies or individuals reporting	Wells					Total pipe laid to Dec. 31, 1901	
		Producing Dec. 31, 1900	Producing, drilled in 1901	Abandoned in 1901	Producing, Dec. 31, 1901	Non producing holes drilled in 1901	Feet	Miles
Pennsylvania	296	3,776	660	239	4,197	143	47,913,618	9,074.55
Indiana	656	4,287	985	700	4,572	208	31,241,320	5,916.92
Ohio	305	885	113	48	950	35	15,199,295	2,878.65
West Virginia	44	418	117	51	544	8	11,852,303	2,244.75
New York	114	535	53	8	580	14	5,785,038	1,095.65
Kansas	48	213	71	28	256	35	2,425,410	459.36
Kentucky	26	101	13	5	109	4	631,535	119.61
California	12	23	4	.....	27	.....	163,450	30.96
Texas	2	13	6	4	15	1	92,696	17.56
South Dakota	3	3	1	.....	4	.....	26,800	5.08
Illinois	22	25	2	.....	27	5	12,000	2.27
Colorado	2	.....	.....	.....	.....	.....	12,000	2.27
Missouri	15	14	3	1	16	.....	2,825	.53
Total	1,545	10,293	2,088	1,084	11,297	453	115,358,290	21,848.16

There were 1,004 more producing wells at the close of 1901 than at the close of 1900, also 50 more wells held in reserve. There were 329 more wells drilled, 93 more wells abandoned, and 84 more dry holes developed in 1901 than in 1900.

The increase in new mains or pipe line laid in 1901 over the pipe line in use at the close of 1900 was 799.79 miles. The greater portion of this increase was in Pennsylvania, West Virginia and Kansas. In Indiana 514 miles were taken up and used elsewhere.

RECORD BY STATES OF THE USE OF NATURAL GAS.

PENNSYLVANIA.

The deep sand territory in southwestern Pennsylvania and the use of gas compressors throughout the different fields brought about an increase in the production of natural gas in this state in 1901 over that of 1900 amounting to $2,472,749, as compared with an increase of $1,878,202 in 1900 over the production of 1899. The price advanced slightly over that of the previous year, but the increase is due almost entirely to the increased quantity marketed. Pennsylvania produced $12,688,161 worth of natural gas in 1901, and consumed $11,785,996 worth, producing $902,165 worth more than was consumed. This state supplied large quantities to New York, Ohio, and a smaller amount to West Virginia. On the other hand it received large quantities from West Virginia, but not enough to make good the quantity supplied by it to other states. Pennsylvania produced almost as much natural gas in value as Ohio, Indiana and West Virginia combined, or about 45 per cent of the whole. There were 4,197 producing wells and 660 drilling wells in the state at the close of 1901; and there were also 239 wells abandoned and 143 dry holes completed in 1901 as compared with 3,776 producing wells, 210 abandoned wells and 142 dry holes for the year 1900.

INDIANA.

The value of the natural gas produced in Indiana during 1901 was $6,954,566, a decrease of $299,973. This is a remarkable record when the decrease in pressure and the exhaustion over the entire field amounted to an average of about 80 pounds at the close of 1901, leaving but 25 per cent of the original quantity packed in the Trenton limestone over an area of about 2,850 square miles.

The decrease of pressure has caused the salt water to invade the gas strata over large areas. The practice of allowing large quantities of gas to escape from the upper portion of the strata so that the petroleum can be secured from the lower portion has been the source of considerable waste, which would have been much greater had not the legislature of the state passed stringent laws prohibiting it.

It is remarkable that with the declining pressure there is not a much greater decline in the quantity marketed, and that many of the wells connected with gas pumping plants continue to produce when the pressure is reduced to a few pounds, or even below that of the atmosphere.

It is due to the gas compressors that the quantity is

maintained. Many of these are arranged to draw the gas into large pumps at low pressure and to discharge it into other smaller pumps, where additional pressure is put upon it. At this rate a few years more, possibly two or three, will see a very large reduction in the production, probably 60 or 80 per cent, and very many individuals and manufacturers that have known the benefits of this most precious fuel will be forced with regret to resort to other methods of heat and light. No other state has parted with this precious fuel for so little compensation. The statistics show that the money received from the sale of natural gas was not over 60 per cent of the value of other fuel, and that the value of the fuel consumed was nearly 81 per cent of the value of that consumed in Pennsylvania. The quantity, therefore, of natural gas consumed in Indiana for a number of years past must be fully as large as that consumed in Pennsylvania, although only about 55 per cent of the value received in Pennsylvania was received in Indiana.

For several years Indiana has furnished a large amount of natural gas to Chicago, approximately 20,000,000 cubic feet per day.

There were 4,572 producing wells in Indiana at the close of 1901, as compared with 4,287 at the close of 1900. There were 985 gas wells drilled, as well as 208 dry holes completed during 1901. There were 656 individuals and companies that produced gas in Indiana, more than double the number in Ohio and Pennsylvania; and there were 597 miles less pipe in Indiana at the close of 1901 than at the close of 1900.

To show the great reduction in pressure in one of the best territories of the state, Grant county, the following report of tests, made by one of the leading producers of the state of Indiana, is given.

The tests were made in August, 1901, so as to make provision for the winter. The last well drilled in November, 1900, six miles southeast of Gas City, as the crow flies, within a mile of being half way between Gas City and Hartford City, which is six miles due east of the well. Here, taking the mid distance as a center, within a radius of four miles is the best territory in the state of Indiana. This well showed in November, 1900, when drilled, a pressure (with correct gauge) of 182 pounds, and on August 28, 1901, it tested 142 pounds, having lost in pressure 40 pounds in 10 months. The well when drilled was dry. It was drilled 28½ feet in Trenton rock and showed a volume by Pitot tube of 1,851,880 cubic feet. August 28, 1901, the well was wet and a correct test was not obtained, but from experience a flow of 1,200,000 cubic feet was estimated.

Another well three-fourths of a mile west and a trifle south of the one described, drilled on July 30, 1899, has the following record:

Date	Rock pressure	Volume in 24 hours
	Pounds	Cubic feet
July 30, 1889	215	2,623,212
August 8, 1900	190	2,208,500
August 28, 1901	145	1,661,100

The last named is our best well, being in a territory that is not drawn from heavily, and it is a good test of the best territory in the state. The pressure of this well is now (February 6, 1902) probably 120 pounds, and will diminish rapidly next fall, as the territory has not the pressure to resist the water.

WEST VIRGINIA.

This state is the hope for the future for the continued supply of gas fuel to Pennsylvania and Ohio. Its rock-bound reservoirs lie deeply buried in the folds of strata over many square miles that have recently been proved, by wells of remarkable volume and pressure, to contain great reservoirs of this most precious fuel.

During the last year Lewis, Harrison, Marion Monongalia and Wetzel counties have produced some remarkable wells from the Gordon sand, the Stray sand, the Fifth and the Elizabeth or Bayard sands, which are from 2,700 to 3,200 feet in depth, and have a volume of from 10,000,000 to 15,000,000 cubic feet in 24 hours and a rock pressure of from 1,000 to 1,300 pounds per square inch. The other counties that have more or less natural gas are Tyler, Ritchie, Doddridge, Marshall, Wood, Wirt, Roane, Calhoun, Boone, Mingo, Kanawha, Logan and Gilmer.

A number of the largest natural gas companies in western Pennsylvania get more or less of their supply from West Virginia and as there are several of them extending their lines farther south, as well as enlarging them, the indications are that the years to come will see very large quantities of natural gas supplied by this state to Pennsylvania and Ohio. There is more natural gas consumed in this state in the development of the petroleum than in any other. For this gas it was impossible to get full or even partial returns.

The value of the natural gas produced in West Virginia from 1889 to 1901 is shown in the following table:

Value of natural gas produced in West Virginia from 1889 to 1901, inclusive.

Year	Value	Year	Value
1889	$12,000	1896	$640,000
1890	5,400	1897	912,528
1891	35,000	1898	1,334,023
1892	500	1899	2,335,864
1893	123,000	1900	2,959,032
1894	395,000	1901	3,954,472
1895	100,000		

OHIO.

This state received very little gas from the original Trenton rock fields during the year 1901, the pressure having been reduced over a large area of about 500 square miles to practically nothing, where it originally

registered 425 pounds. The failing supply from the original field was partially made up from the Sugar Grove field, 150 miles to the southwest. A number of additional towns were supplied from this field during the last two years, and this has caused a great reduction in its pressure, which has declined from 750 pounds to the square inch until the average pressure was less than 160 pounds at the close of 1901, although there was an average pressure of 350 pounds at the close of 1900. This shows the immense drain on this pool, which must have supplied over $1,500,000 of the total of $2,147,215 produced during the year 1901. There was a new pool of natural gas developed in Morgan township, Knox county, from the same horizon as that found in the Sugar Grove field. There are a number of natural gas pools in Guernsey, Belmont, Noble and Perry counties, which get their gas from the Berea sand, and supply the towns of Cambridge, Corning, New Lexington and numerous other small places.

In Ashtabula county a number of small gas wells have been secured from the corniferous limestone, which have lately been piped to Ashtabula and Jefferson. West Virginia, however continued to furnish a large quantity of natural gas to Ohio, supplying Marietta, Belpre, Newport, New Matamoras, Sardis, Powhatan, Dennison, Uhrichsville, Canal Dover, Canton, Massillon, Akron, and in part Steubenville, East Liverpool, Toronto, Bridgeport, Mingo and Wellsville. The indications are that a much larger quantity will be delivered to Ohio from West Virginia in the future. Indiana and Pennsylvania also furnished a decreasing amount during 1901.

NEW YORK.

Natural gas is found over a very large area in the western portion of New York in a number of different sands and limestones, including the Devonian black slate, the Bradford sand, and the underlying Kane and Elk sands, the corniferous limestone, the Medina sandstone, the Trenton limestone and the upper calciferous. The greater portion of the gas comes from the neighborhood of Wellsville and Ricebrook, in Allegheny county, from the sands found in the upper Devonian. There are a vast number of wells scattered along the south shore of Lake Ontario that furnish from one to four families with gas. The greater portion of the natural gas consumed in the state comes from Pennsylvania, the largest consumption being in the city of Buffalo. The town of Fredonia used natural gas as far back as 1821 from natural flows and shallow wells, and has the honor of first making use of it as a source of light and heat. The counties producing natural gas are Allegheny, Cattaraugus, Erie, Livingstone, Niagara, Onondaga, Ontario, Oswego, Seneca and Steuben. The value of the natural gas produced in 1901 was $293,232, being a considerable decrease as compared with the year previous, while the value of the amount consumed was $1,694,925, showing that only about 18 per cent is produced in the state. The number of wells producing at the close of 1901 was 580, as compared with 535 at the close of 1900. There were 1,096 miles of natural gas mains from two inches and over in use at the close of 1901.

KANSAS.

No other state increased as largely in the production of natural gas as Kansas during 1901, and southeastern Kansas seems awakening to the fact that it has buried under its fertile, gently undulating surface reservoirs of the most valuable fuel, and is capable of furnishing large quantities to private consumers and manufacturers at prices that will attract outside capital as well as enable the native products to be profitably worked. Already the towns of Neodesha, Coffeyville, Cherryvale, Iola, Independence, Chanute, Paola, Parsons and Osawatomie and numerous villages have a regular supply.

KENTUCKY.

The principal gas area thus far developed is in eastern Kentucky, in Martin county. There are some fair gas wells in western Floyd county. Ashland, Catlettsburg and Louisa are supplied from this region. In Meade county there is still found some shale gas, which is conveyed to Louisville. During the fall of 1901 a large gas well was developed near the Beaver oil pool in Wayne county. There is also a fair gas well over the state line in Fentress county, Tenn. There is a small supply of gas obtained for domestic use in Breckinridge county, in the vicinity of Cloversfoot, also in Hardin and Jefferson counties.

There was a slightly decreased amount of natural gas sold in this state in 1901 as compared with the previous year. A considerable quantity was consumed in West Virginia and Ohio, which was supplied by Kentucky. The value of the natural gas produced during 1901 was $270,871, and of this amount $187,660 was marketed in the state. The value of other fuel displaced for the same year was $206,426. There were 109 producing wells at the close of 1901, as compared with 101 producing at the close of 1900.

CALIFORNIA.

Although there are numerous small gas wells in this state, by far the greatest production comes from wells at the city of Stockton, in the great San Joaquin valley. It is also found near the city of Sacramento, in the Sacramento valley, in Tulare county, near Tulare lake, and in Tehama county. To a small extent it is produced by a few wells at the city of Los Angeles. In the two former instances it is associated with artesian water flows. At Stockton the wells are 2,000 feet deep, yet none of them has passed through the alluvial deposit into the solid stratified measures. Under the pressure of 2,000 feet water will absorb a large amount of gas, which is gradually liberated as it ascends in the well and the pressure diminishes. Ten of these wells at Stockton yield about 30,000 cubic feet of natural gas a day. It is questionable whether the flow of most of the water from artesian wells is not due to gas pressure rather than to artesian head in

a porous stratum, to which it is generally credited.

The following is taken from the Pacific Reporter, contributed by Mr. A. S. Cooper, formerly state geologist of California:

There are a number of wells yielding natural gas in California. In most of these wells there is no free gas. This is clearly shown by the fact that when the wells cease to flow water the flow of gas ceases.

The absorbing power of different liquids for different gases varies greatly. It is facilitated by low temperature and high pressure. Under one atmosphere 100 volume of water will absorb about four volumes of natural gas. When the water enters the bottom of the casing of a well the gas is in solution with the water; as the water ascends the well the pressure is decreased and the gas is liberated.

Crude California oil when exposed to the atmosphere gradually evaporates. Light hydrocarbons are constantly splitting off and the residue grows richer in carbon until finally the result is hydrocarbon rich in carbon and sulphur. The oil becomes thick like molasses, then viscous, plastic, hard and finally brown and friable.

The accompanying table shows that the natural gas in the different fields varies as to the percentage of the different gases present, although it usually contains the same gases in uncertain quantities. Analyses also show that the flow from the same well is subject to daily variations in composition.

Hydrogen, carbonic acid, carbonic oxide, sulphureted hydrogen and oxygen have been introduced into the natural gas from extraneous sources by circulating water, or by chemical actions other than that necessary for the production of natural gas; therefore the variableness in the composition of natural gas.

The presence of gas is the cause of spouting wells. If a well is sunk into the top of a porous stratum containing free gas the gas will escape, but if the well penetrates a porous stratum where the gas is in solution with the oil under pressure a mixture of gas and oil will be thrown out of the well. This will continue until the gas pressure is exhausted and the well will have to be pumped.

Composition of natural gases of California.

Constituent.	1	2	3	4	5	6	7	8	9	10
Hydrog. sulphide.	.....	.....	.....	.....	.....	Trace.	Trace.	.....	.....	.....
Heavy hydrocarbons (C. H.)...	0.10	Trace.	.....	.....	.....	.....	.....	0.30	.....	.....
Light hydrocarbons (C. H.)..	.80	0.70	0.40	.....	.....	0.80	.....	.30	.....	.....
Oxygen	Trace.	.....	.10	Trace.	0.20	.20	Trace.	.80	0.10	.....
Nitrogen	.....	.....	20.10	18.80	25.00	27.20	32.20	3.20	49.40	3.30
Carbonic oxide...	.10	.30	.20	.20	.20	.....	.....	.10	.....	.....
Carbonic acid....	.10	.50	.70	.70	.60	.20	.70	.90	3.10	.60
Ethanic	.....	.....	.....	Trace.	.10	.40	.....	.....	.....	.....
Marsh gas.....	95.80	94.60	70.60	78.00	73.90	68.70	66.60	86.80	47.40	96.10
Hydrogen	3.10	3.90	7.90	2.20	.....	2.40	.40	7.60	.....	.....
	100.00	100.00	100.00	99.90	100.00	99.90	99.90	100.00	100.00	100.00

1. From Minor's rancho, Contra Costa county. Came through the sandstone in a small spring of water. From a hole five feet in diameter and six feet deep.
2. From a well 1,300 feet deep, from which water was flowing copiously, on Minor's rancho, Contra Costa county.
3. Corner La Fayette and Lincoln streets, Stockton.
4. Shipyard well, Stockton.
5. North and Hunter streets, Stockton.
6. Jackson well, Hot Mineral bath, Stockton.
7. Greenwood well, American and Miner avenues, Stockton.
8. Orland, Tehama county.
9. Marsh gas from marsh ground.
10. Blower in coal mine.

A spouting well is similar in action to a bottle of champagne. When the bottle is first opened a mixture of gas and wine is driven from the bottle; when the pressure of gas is decreased the wine has to be poured from the bottle.

As will be seen by the analyses of the natural gases of California, they are largely made up of methane debased with nitrogen, a nonluminant. It is a good fuel gas, but possesses no great value as an illuminant in its natural state. It can be converted into an excellent illuminant gas by passing it through incandescent coal, decomposing it, carbon being deposited on the coal and hydrogen being released. The hydrogen is then mingled with the vapors of crude oil; this mixture is passed through heated checker brick, forming a permanent gas. Its candle power is regulated by the quantity of crude oil vapor introduced.

Owing to the high heating power and small luminosity of natural gas, the use of a mantle of rare earths or metals greatly increases the candle power of its light.

The value of the natural gas produced in California from 1889 to 1901 is shown in the following table:

Value of natural gas produced in California from 1889 to 1901, inclusive.

Year	Value	Year	Value
1889	$12,680	1896	$55,628
1890	33,000	1897	50,000
1891	30,000	1898	65,337
1892	55,000	1899	86,891
1893	62,000	1900	79,083
1894	60,350	1901	67,602
1895	55,000		

There were 27 wells producing more or less gas and water at the close of 1901, as compared with 23 at the close of 1900. During 1901 four wells were drilled and nearly 31 miles of main pipe line were in use.

UTAH.

No natural gas has been produced in this state for two years. The wells, 12 miles north of Salt Lake City, have become choked up by the decomposition of the slate forming the walls of the gas wells.

The value of the natural gas produced in Utah from 1893 to 1901 has been as follows:

Value of natural gas produced in Utah from 1893 to 1901, inclusive.

Year	Value	Year	Value
1893	$500	1898	$7,875
1894	500	1899	.....
1895	20,000	1900	.....
1896	20,000	1901	.....
1897	15,050		

TEXAS.

Some wonderful pockets of high pressure gas have been developed in the Beaumont field, which blew up boulders and sand mixed with water and traces of petroleum. The gas strata were usually developed about 200 feet above the oil pay. When the pressure was confined it developed 250 pounds to the square inch, and after the gas originally in the rock had been exhausted the gas under pressure was used to assist the petroleum wells to flow by having the gas turned into the petroleum wells. The gas under pressure spread itself over the surface of the petroleum in the porous limestone and thereby started the wells to flow.

Toward the close of the year there was a company organized to supply Beaumont, but the declining pressure in the field caused the undertaking to be abandoned.

All of the large producing wells when flowing gave out more or less natural gas, which is highly charged with sulphuretted hydrogen, and is very deadly in effect when taken into the lungs in large quantities.

During the year a very large gas well was developed on Bryans mound, near the shore of the gulf, and near the Brazos river, in Brazoria county, which gave a persistent supply of 2,000,000 to 3,000,000 cubic feet per day.

Numerous artesian wells along the gulf coast give off considerable natural gas with the artesian water, whose flow is no doubt caused by the expansion of the gas rather than by a hydraulic head.

Corsicana produces some natural gas which is used in several instances to fire boilers and drive gas engines in the petroleum field, although only in a few cases is it made use of as a domestic fuel.

CANADA.

The Welland county field in Ontario, near Buffalo, continues to furnish gas to Buffalo, N. Y. The Essex county field formerly furnished a large amount of natural gas to Detroit, Mich. The drain on both of these fields has been felt, as there has been a very considerable reduction in the rock pressure. There is some natural gas found in the oil region between Petrolia and Sarnia, which is mostly used in gas engines that are pumping oil wells. The value of the production for 1901 shows a decrease of over $100,000 as compared with that of 1900. These figures are supplied by the Mineral Statistics and Mining Bureau, Ottawa, Canada.

The value of the natural gas produced in Canada from 1892 to 1901 is shown in the following table:

Value of natural gas produced in Canada from 1892 to 1901, inclusive.

Year	Value	Year	Value
1892	$150,000	1897	$325,873
1893	366,233	1898	364,699
1894	313,754	1899	387,271
1895	423,032	1900	417,094
1896	364,156	1901	312,359

The value of natural gas piped from Canada to the United States and consumed in the cities of Detroit and Buffalo during the year 1901 amounted to $361,719, as compared with $672,362 in the year 1900, a decrease of $310,643. The supply was shut off from Detroit, Mich., the latter part of August, 1901, by order of the Canadian government, which accounts in part for the large falling off in the amount exported into the United States during 1901.

The following table furnished by the Bureau of Mines, Toronto, shows the number of producing wells, miles of pipe, workmen employed, value of the gas

product at the point of production and the wages for labor. The values are generally placed at the points of consumption:

Statistics of natural gas production in the Province of Ontario, Canada.

Year	Producing wells	Miles of gas pipe	Workmen employed	Value of gas product	Wages for labor
1893.....	107	117	59	$238,200	$24,592
1894.....	110	183½	99	204,179	53,130
1895.....	123	248	92	282,986	73,328
1896.....	141	287¼	87	276,710	47,527
1897.....	140	297	84	308,448	42,338
1898.....	142	315¼	85	301,599	31,457
1899.....	150	341½	95	440,904	40,149
1900.....	175	306	161	392,823	43,636
1901.....	158	368	129	342,183	59,140

THE LEADING NATURAL GAS COMPANIES OPERATING IN THE UNITED STATES.

Pennsylvania Gas Company, organized 1883. C. N. Payne, president; J. P. Jefferson, vice president; W. H. Filler, secretary and treasurer; J. W. Kitchen, assistant treasurer. Two hundred and ten gas wells are operated by this company in the gas fields of Roystone, Kane and Elk county, Pa. The company supply the cities and towns of Erie, Corry, Warren, Glade Run, Stoneham, Clarendon, Tiona and Sheffield, Pa., and Jamestown, N. Y., with natural gas. The gas is supplied to these cities and towns through 8 and 12-inch iron pipes. (Commonly known as gas mains or gas trunk pipe lines.)

Philadelphia Company (Successors to the Philadelphia Natural Gas Company.) Joseph F. Guffey, general manager, Pittsburg, Pa. Philadelphia Company supply Pittsburg and Allegheny, Pa., with natural gas from the gas fields in Armstrong, Westmoreland, Allegheny, Washington and Green counties, Pa., and Wetzel, Tyler and Lewis counties, West Virginia. Size of main lines 6, 8, 10, 12, 16, 18, 20, 30 and 32 inches in diameter.

The Manufacturers Light and Heat Company, general headquarters, Pittsburg, Pa. H. B. Beatty, president; O. H. Strong, vice president; L. A. Meyran, second vice president; E. H. Myers, treasurer; H. E. Seybert, secretary and assistant treasurer; L. B. Beatty, auditor and assistant secretary. Directors, H. B. Beatty, O. H. Strong, L. A. Meyran, E. H. Myers, Fred. N. Chambers, Geo. W. Crawford, H. M. Nichols, E. V. Seldon, H. J. Beers, David Iseman, James Kuntz, Jr. The Manufacturers Light and Heat and principal affiliated companies: Tri-State Gas Company, The Wheeling Natural Gas Company, Venture Oil Company, The Ohio Valley Gas Company, Sewickly Illuminating Gas Company, New Cumberland Water and Gas Company, The Wetzel Gas Company. Producers and suppliers of natural gas for fuel and all purposes. The supply of gas is produced from the gas fields of Butler, Beaver, Lawrence, Allegheny Washington and Green counties, Pa., and Monongalia, Marshall, Wetzel and Tyler counties, West Virginia. Acreage under lease 448,979; operating 2,447 miles of gas mains; size of mains 6, 8, 10, 12, 14, 16, 18, and 20 inches in diameter; 890 wells of which 241 produce oil; with principal distributing plants in the following cities and towns: Pittsburg, Allegheny, Washington, McDonald, Waynesburg, Canonsburg, Carnegie, Corapolis, Bellevue, Avalon, Ben Avon, Glenfield, Emsworth, Sewickley, Rochester, Beaver Falls, New Brighton, Beaver, Ellwood City, New Castle, Monaca, Clairton, McKees Rocks, and Claysville, Pa., East Liverpool, Wellsville, Toronto, Empire, Steubenville, Brilliant, Martins Ferry, Bridgeport, Bellaire, Knoxville, Clarington and Sardis, Ohio, Chester, New Cumberland, Wellsburg, Wheeling, Benwood, McMechen, Moundsville, Cameron and New Martinsville, W. Va.

Taylorstown Natural Gas Company, W. J. Young, president; James I. Buchannan, secretary and treasurer. This company supplies Taylorstown, Taylorstown Station (Crothers) and Claysville, Pa., with natural gas.

Carnegie Gas Company (affiliated with the United States Steel Company); D. M. Clemson, president; N. Johnson, vice president and superintendent; general headquarters, Pittsburg, Pa. This company produces and supplies natural gas to the Homestead Steel Works, Duquesne and Edgar Thompson Steel Works. This company operates 160 wells in the gas fields of Armstrong, Indiana, Washington and Green counties, Pa., and Wetzel, Tyler, Marion and Doddridge counties, W. Va. The company operates 271 miles of main lines and 351 miles of branch lines; the lines extend 40 miles north and 100 miles south of the mills; size of lines 8, 10, 12, 16 and 20 inches in diameter. The mills consume 60,000,000 cubic feet of natural gas per day.

Mountain State Gas Company; principal office, Oil City, Pa.; incorporated under the laws of the State of West Virginia September 6th, 1892; authorized capital $500,000; par value shares $100; amount subscribed $50,000; amount paid in $10,000; incorporators, E. Strong, Oil Cty, Pa.; N. F. Clark, Oil City, Pa.; H. W. McSweeney, Oil City, Pa.; C. N. Payne, Titusville, Pa; Joseph Seep, Titusville, Pa

Mountain State Gas Company (Sistersville, W. Va., division); E. Strong, president; H. W. McSweeney, secretary; J. B. Crawford, treasurer; R. W. Brink, local manager. Supplies Sistersville, Trail run, Miller's run, Cochransville, New Matamoras, Friendly and Grand View with natural gas.

Hope Natural Gas Company; incorporated under the laws of West Virginia September 17, 1898. The Hope, People's Reserve and Connecting natural gas companies are operated jointly under the management of the Hope Natural Gas Company. Principal office, Oil City, Pa. Incorporators, E. Strong, Oil City, Pa.; H. W. McSweeney, Oil City, Pa.; Jno. Tomkin, Oil

City, Pa.; C. N. Payne, Titusville, Pa.; Robert S. Hampton, Titusville, Pa. Glen T. Braden, president and general manager. Headquarters, Pittsburg, Pa. The Hope, People's Reserve and Connecting natural gas companies are the gas producing companies. The People's company operate in the gas fields of Armstrong, Indiana, and Green county, Pa. The Hope, Reserve and Connecting gas companies operate in the gas fields of Monongalia, Marion, Wetzel, Tyler, Doddridge, Harrison, Lewis, Ritchie and Calhoun counties, W. Va. The Hope, Reserve and Connecting gas companies own and operate the largest natural gas pump station in the world. It is known as Hastings station, located near Pine Grove, on the Short Line railroad (B. & O. R. R.) in Wetzel county, W. Va. The field supply pipe lines are 8, 10, 12, 16, 18 and 20 inches in diameter. The main fields that supply those companies with gas are Sand Fork, Freeman's creek, Fink and Riverside, Lewis county, W. Va., Wilsonburg and Big Isaac, Harrison county, W. Va.; Farmington, Marson county, W. Va.; Willow Fork, Tyler county, W. Va.; Pine Grove and numerous other gas fields in Wetzel county, W. Va. All the supply lines connect with the pump station at Hastings, which is the central point of gas supply. The main supply line, known as the Pittsburg line, is two 10-inch lines from Hastings station, W. Va., to Glover, W. Va., distance 16 miles, one 16-inch line; from Glover to Brave, Pa., distance 17 miles; one 20-in. line from Brave to Pittsburg. This company operates and supplies its customers in Pennsylvania under the name of the People's Natural Gas Company. The main supply line, known as the Cleveland line, one 10-inch and one 18-inch line from Hastings station to Ohio river, near Powhatan, Ohio; from the Ohio river to Cleveland this company is known as the East Ohio Gas Company. The officers of the East Ohio Gas Company are E. Strong, president; C. N. Payne, vice president; H. V. Shulters, secretary and treasurer; M. B. Daly, general manager; W. W. Richardson, superintendent; general headquarters, Cleveland, Ohio. The East Ohio Gas Company supplies Uhrichsville, Dennison, New Philadelphia, Canal Dover, Massillion, Canton, Akron, and Cleveland with natural gas..

The main supply line, known as the Barnsdall connecting gas line, one 18-inch line from Hastings station to Gaston station, W. Va., distance 33 miles; two 10-inch lines from Gaston station to Dry Fork station, W. Va., distance 10 miles; one 12-inch line from Dry Fork station to Schultz station, W. Va., distance 36 miles; three 10-inch lines from Schultz station to Sugar Grove station, Ohio. The station at Sugar Grove is an intersection meter station. From this station the Northwestern Ohio Natural Gas Company and the Union Natural Gas Corporation receive their main supply of gas. The officials of the Northwestern Ohio Natural Gas Company are as follows: Daniel O'Day, president, New York city; C. N. Payne, vice president, Titusville, Pa.; E. Strong, second vice president, Oil City, Pa.; M. B. Daly, general manager, Toledo, O.; J. W. McMahon, general superintendent, Toledo, O.; R. J. Burkhalter, assistant secretary and treasurer, Toledo, O. This company receives part of its supply from the counties of Fairfield, Hocking, Licking and Knox, in Ohio. Its main line extends northwest through the counties of Fairfield, Licking, Franklin, Delaware, Marion, Wyandot, Hancock, Wood and Lucas to Toledo. This line supplies Toledo, Maumee and Perrysburg, Ohio, with natural gas.

Union Natural Gas Corporation, T. N. Barnsdall, president; E. P. Whitcomb, secretary and treasurer. The Union Natural Gas Corporation supplies Athens, Chillicothe, Circleville, Logan, Newark, Mt. Vernon, Galena, Delaware, Marion, Upper Sandusky, Galion, Crestline, Findlay, Mansfield, Ashland, Shelby, Tiffin, Fortoria, Freemont, Toledo, Plymouth, Norwalk, Elyria, Lorain, Vermillion and Sandusky, Ohio, with natural gas. Size of main lines, 3, 4, 6, 8, 10, 12 and 16 inches in diameter.

Potter County Gas Company, T. N. Barnsdall, president; J. F. Stone, secretary and treasurer. Gas field, Card creek, Potter county, Pa. Supplies Elmira, N. Y., with natural gas. Size of main line 8 inches in diameter.

United Natural Gas Company, W. C. Henry, general superintendent, Bradford, Pa. Supplies Buffalo, N. Y., with natural gas under the name of Buffalo Natural Gas Company (Salamanca, N. Y., United Natural Gas Company), (Olean, N. Y., Keystone Gas Company), (Bradford, Pa., Commercial Natural Gas Company). Gas fields at Kane, Wilcox, Halsey and Mt. Jewett, McKean county, and Sharon township, Potter county, Pa. Size of main lines 8 inches in diameter.

Bradford Gas Company, supplies Bradford, Pa., with natural gas, from Rowlet or Card creek gas field in Potter county, Pa. Size of main line 10 inches in diameter.

Ohio Fuel Supply Company, George W. Crawford, president; F. W. Crawford, vice president; H. C. Reeser, secretary and treasurer; J. M. Garard, general manager. Supplies Columbus, Lancaster, Mt. Vernon, Zanesville, Barnesville, Cambridge and Caldwell, Ohio, with natural gas. Gas supplied from Sugar Grove and Knox and Licking counties. Gas fields in Ohio. Size of main lines 4, 6, 8, 10 and 12 inches in diameter.

Pennsylvania Fuel Supply Company, C. E. Crawford, president; H. C. Reeser, secretary and treasurer. Gas supplied from Speechley gas field, Clarion and Armstrong counties, Pa. Supplies Maysville, Oak Ridge, Fairmont, New Bethlehem, Edenburg, St. Petersburg, Emlenton, Foxburg and Parker, Pa., with natural gas.

The Southern Ohio Gas Company, capital $300,000. George W. Crawford, president; John M. Garard, vice president; H. C. Reeser, secretary and treasurer. Supplies Wellston, Jackson and Hamden, O., with natural gas.

Fayette County Gas Company, George W. Crawford, president; John M. Garard, vice president and general manager; J. W. Donnan, treasurer; H. C.

Reeser, secretary and assistant treasurer. General office, Pittsburg, Pa. Supplies Uniontown, Connellsville, Scottdale, Mt. Pleasant, Dunbar, Dawson, Alverton, Tarrs, Ruffsdale and Youngwood, Pa., with natural gas. Gas supplied from Masontown and Carmichaels gas fields in Fayette and Green counties, Pa., and Farmington gas field in Marion county, W. Va. Size of main supply lines 8 and 12 inches in diameter.

Oil City Fuel Company, Oil City, Pa. Supplies Oil City, Titusville, Franklin, Meadville and Sharon, Pa., with natural gas. Gas supplied from 460 wells in the Speechley gas field in Venango county, Pa. Size of main supply lines 5⅝, 8 and 10 inches in diameter.

Warren and Chautauqua Gas Company, Warren, Pa., William Barnsdall jr., president; James Clark, vice president; E. P. Whitcomb, secretary and treasurer. Supplies Warren, Glade run, Stoneham, Clarendon, Tiona and Sheffield, Pa., with natural gas. Gas supplied from 19 gas wells in the Elk county, Pa., gas field. Size of main supply line 8 inches.

Manufacturer's Gas Company, Bradford, Pa., T. N. Barnsdall, president; William Barnsdall, jr., secretary and treasurer; William Barnsdall, jr., general manager. Supplies Kane, Bradford, East Bradford, State Line, Pa., and Limestone, N. Y., with natural gas. Gas supplied from Jamestown, Elk county, and Kane, McKean county, Pa., gas fields. Size of main lines 4, 6 and 8 inches in diameter.

Triple-State Natural Gas and Oil Company, general office, Franklin, Pa.; incorporated under the laws of West Virginia in 1898. W. O. Johnson, president, Chicago, Ill.; Otto Germer, first vice president, Erie, Pa.; Thomas Brown, second vice president, Franklin, Pa.; J. B. Moorehead, secretary, Franklin, Pa.; E. H. Sibley, treasurer, Franklin, Pa. This company have at present about 125,000 acres of land located in Martin and Johnson counties, Kentucky, and Mingo county, W. Va. This company supplies Guyandotte, Ceredo, Central City, Kenova and Huntington, W. Va., Coal Grove and Ironton, O., Inez, Louisa, Catlettsburg and Ashland, Ky., with natural gas. Size of main lines 8 and 10 inches in diameter. Length of main line from wells to Kenova, 10-inch line, 50 miles; main line from Kenova east to Huntington, nine miles 8-inch line; to Ironton, O., and Ashland, Ky.

The Natural Gas Company of West Virginia, Geo. Heard, president; A. S. Hare, secretary. Supplies Wheeling, W. Va., with natural gas. Supply of gas from Jacktown gas field, Green county, Pa.

Mountain State Gas Company (Parkersburg-Marietta division), E. Strong, president; H. W. McSweeney, secretary; J. B. Crawford, treasurer; W. P. Craig, general field superintendent. Supplies Parkersburg, Williamstown, Waverly, Eureka, Belmont and St. Marys, W. Va., with natural gas. Also supplies Marietta, Belpre and Newport, Ohio, with natural gas under the name of River Gas Company.

Fairmont Gas and Light Company, Fairmont, W. Va., S. S. Watson, president; Edwin Robinson, secretary. Supplies Fairmont, W. Va., with natural gas. Gas supplied from Farmington, W. Va., gas field.

Home Gas Company, Mannington, W. Va., F. W. Bartlett, president; W. H. Furbee, secretary and treasurer; J. M. Barrack, superintendent. Supplies Mannington with natural gas. The gas is supplied from Brink and Downs, W. Va., gas fields. Size of main supply lines 4 and 6 inches in diameter.

Fairmont and Grafton Gas Company, Joseph W. Craig, president; A. C. Lowrie, vice president and general manager; C. W. Baker, secretary and treasurer. General office Fairmont, W. Va. Supplies Fairmont and Grafton with natural gas. Supply of gas from Farmington gas field.

The Clarksburg Light and Heat Company, Clarksburg, W. Va., John I. Alexander, John Koblegard, E. R. Davis, B. F. Robinson and F. B. Haymaker, incorporators. Successors to Mountain State Gas Company and the West Fork Oil and Natural Gas Company of Clarksburg. E. Strong, president; C. N. Payne, general manager; John Tonkin, assistant manager. Supplies Clarksburg with natural gas.

Union Utility Gas Company, Morgantown, W. Va.; I. C. White, president; Davis Elkins, vice president; George C. Sturgiss, secretary; H. R. Warfield, general manager. Supplies Morgantown with natural gas. Supply of gas from Dunkard township, Green county, Pa., and Cass district, Monongalia county, W. Va.

The Wetzel Natural Gas Company; Augustus Arnold, president and treasurer; E. B. Woodruff, secretary; A. J. Throckmorton, manager. Supplies Hundred, W. Va., with natural gas.

Virginia Oil and Gas Company, Wheeling, W. Va.; Albert M. Schenk, president; George Folmer, secretary. Supplies Wheeling, Benwood and Moundsville, W. Va., with natural gas. Supply of gas from Majorsville gas field, Green county, Pa.

Light, Fuel and Power Company, Sutton, W. Va.; F. J. Robert, president; C. E. Bonwell, general manager. Supplies Burnsville, Sutton, Heater, Coglers, Chambers and Flat Wood, W. Va., with natural gas. Supply of gas from Burnsville gas field.

The Keener Oil and Gas Company, Weston, W. Va. Supplies Weston with natural gas. Supply of gas from Big Isaac gas field.

Weston Gas Company, Weston, W. Va.; W. S. Hoskins, president; J. W. Wilson, secretary; F. M. Knapp, treasurer. Supplies Weston with natural gas. Supply of gas from Maxwell farm wells Nos. 1 and 2 at Weston. Size of main supply lines 4 and 6 inches in diameter.

West Virginia Central Gas Company; Howard A. Forman, president; H. V. Thomas, general manager.

Supplies Audra, Janelew, Philippi, Belington, Elkins, Deanville and Buckhannon, W. Va., with natural gas. Supply of gas from Riverside and West Fork river gas field, Lewis county, W. Va. Size of main supply lines, 4 and 6 inches in diameter.

Glenville Natural Gas Company, Glenville, W. Va. Supplies Glenville with natural gas. Supply of gas from Trace Fork gas field, Gilmer county, W. Va.

Salem Natural Gas Company, Salem, W. Va. Supplies Salem with natural gas. Supply of gas from Sedalia gas field. Size of main line 4 inches in diameter.

Cabot Gas Company, Grantsville, W. Va. Supplies Grantsville and Cabot carbon factory with natural gas. Supply of gas from Leaf Bank creek gas field, Calhoun county, W. Va.

Charleston Gas Company, Charleston, W. Va. Supplies Charleston with natural gas. Supply of gas from Spencer, W. Va., gas field.

Marietta Consolidated Gas Company, Marietta, O.; H. A. Jamieson, president; W. J. Cram, vice president; W. D. Todd, secretary; W. F. Messner, treasurer; A. A. Schnaufer, general manager. Supplies Marietta with natural gas. Supply of gas from Tunnel and Vincent gas fields, Washington county, O.

Elizabeth Gas Company, Elizabeth, W. Va. Supplies Elizabeth with natural gas. Supply of gas from Elizabeth gas field.

Jeanette Gas Company, Jeanette, Pa.; Joseph W. Craig, president. John W. Shay, vice president; C. W. Baker, secretary and treasurer. Supplies Irwin, Jeannette, Penn station and Manor, Pa., with natural gas. Supply of gas from Harmony gas field, Westmoreland county, Pa. Size of main lines 6 and 10 inches in diameter.

Greensboro Natural Gas Company. General office, Pittsburg, Pa. John W. Shay, president and general manager; Jos. W. Craig, vice president; C. W. Baker, secretary and treasurer. Supplies Greensburg, Carmichael, New Geneva, Masontown, Bridgeport, Brownsville, West Brownsville, California, Coal Center, Donora, Charleroi and the steel works at Claiton, Pa., with natural gas. Supply of gas from Bellsville and Zollersville gas fields, Washington county, Pa. Size of main lines 6, 10 and 12 inches in diameter.

Valley Gas Company; H. M. Preston, president; W. S. Hoskins, vice president; F. M. Knapp, secretary and treasurer. Supplies Hazel Chemical works, glass factory and Hazelhurst, Pa., with natural gas. Supply of gas from Hutchins gas field, McKean county, Pennsylvania.

Jefferson County Gas Company, Warren, Pa.; George E. Degolia, president and general manager; J. A. Viele, treasurer; E. J. Brennan, secretary. Supplies oil refineries located in East Warren with natural gas. Supply of gas from Heath gas field, Jefferson county, Pa. Size of main lines 6 and 8 inches in diameter; length of line 42 miles.

Cambridge City Gas Company, Cambridge City, Indiana; C. Ferguson, president; Edward McDonald, secretary and treasurer; A. C. Forinfger, general manager. Supplies Cambridge City with natural gas. Supply of gas from Maysfield, Ind., gas field; 16 miles of 4-inch main line.

Ohio and Indiana Consolidated Natural and Illuminating Gas Company. Supplies Lima, Ohio, with natural gas.

Form of natural gas meter notice in general use by the leading natural gas companies.

June 1, 1903.

To WARREN & CHAUTAUQUA GAS CO, Dr.
Office, Diamond Block, Water St., Warren Pa.
Bring this Bill and save your Discount.

Amount Delinquent.
Previous State 000

State of meter.....000 Taken....
To Consumption of...000 | Cubic feet gas at 27c

Subject to discount of two cents per 1,000 cubic feet if paid at the office on or before the 10 of each month.

Allowing the time for discount to expire does not give an extension of the bill. Full rate, 27c, will be charged in every case after the 10th.

Received payment,
Warren & Chautauqua Gas Co.
Per.....

The inventor of the Wellsbach or incandescent mantle for gas lights was Amer Von Wellsbach, of Vienna, Austria-Hungary.

CARBON BLACK.

The history of petroleum and natural gas would be singularly incomplete without the history of the manufacture of carbon black. Carbon black is also known as hydro carbon black, American gas black, satin gloss black, jet black, and silicate of carbon. Carbon black is the trade name given in this country, and to a certain extent abroad to lamp black made upon the surfaces of metal or stone by direct impact of flame. The first carbon black ever made in this country and sold in a commercial way seems to have been made in the year 1864 by an ink maker, J. K. Wright, of

Philadelphia, Pa., for use in printing ink. Mr. Wright is still living and engaged in the same business. It is therefore, plain that this industry is a new one in this country, and it certainly never attained any great importance abroad, although I cannot say when it was first made in other countries. Mr. Wright made black on sheet iron cylinders revolved over gas jets, from which the black was removed by stationary scrapers. This process was used by other ink makers for making carbon black from artificial gas in a small way for use in printers' ink, and a very glossy high priced ink of intense color was obtained. These pioneers in the carbon black industry apparently did not consider the process of sufficient importance to patent it, for the first patent granted in this country was issued December 10, 1867, to A. Millochan, New York, for a process which proved to be of no value, and it was not until the year 1872 that any process was patented that was subsequently used on a regular commercial scale. It had attracted the attention of many different people, among others Peter Neff, Gambier, Ohio, and John Howarth, Salem, Mass., that large quantities of natural gas were going to waste in the gas regions offered a cheap and abundant raw material for this manufacture, and on September 17, 1872, John Howarth received a patent for the manufacture of carbon black from natural carburated hydrogen gas, claiming the production of carbon black from a natural carburated hydrogen gas issuing from the earth, etc. His plan was to connect the gas well with a gas holder, such as used in artificial gas works, with a blow-off, from which might escape the surplus flow of the well, not required in the process of manufacture. As the natural pressure of gas in the rock sometimes exceeds 500 pounds on the horizon from which he derived the supply of his factory, and there was at that time no method of regulating the flow, this waste of gas was a necessary feature of his enterprise. From the gas holder the gas passed through pipes to ordinary iron gas jets arranged in the same horizontal plane beneath slabs of soapstone.

These slabs of soapstone were provided with holes for ventilation without which the carbonic acid gas and other inert products of combustion would have formed a layer about the middle of the slabs and kept the flame away from the surface, thereby greatly diminishing the yield and impairing the color of the resulting product. Above these slabs of soapstone rose in an arch an iron dome or hood with a chimney at the top of this arch, and in this chimney a damper that could be set to give the right amount of draft. On the slabs rested pans of water closed in and kept cool by a continuous circulation. The edges of this arch descended below the edges of the soapstone slabs and were grooved longitudinally with horizontal grooves, in which ran a scraper that could be pulled to and fro by hand with a long handle. This scraper removed, from time to time, the deposited soot which fell into the sheet iron aprons or troughs, which hung from the burner pipe. From these again the black fell through discharge pipes into receptacles which could be changed by hand when full. This was a very crude, clumsy and expensive way of making carbon black, decidedly less advantageous than that previously employed in making black from artificial gas, but nevertheless, owing to the cheapness of the raw material, the price which had been $3.00 to $5.00 was immediately dropped to $2.50 and then to $1.50, and shortly after to $1.25 per pound. It is, however, a curious fact that the black from natural gas does not possess all the qualities of that made from artificial gas, hence some small amount is still made from artificial gas, and also from oil at an expense of something like a dollar a pound, and used in a very small way for certain fine grades of ink.

The next patent granted for carbon black was for a cylinder cooled externally by water and slowly revolving over burners placed on its interior, but I am not aware that this process was ever used.

On March 23, 1875, John Howarth received a further patent on a traveling car, which hung from rails also held between them the slabs themselves. This car carried a scraper, a shallow frame and hanging from that frame on each side two deep receptacles of sheet iron, which could be detached at will and emptied. These receptacles were joined together over the burners by a narrow arch of sheet iron just wide enough to allow the apparatus to pass over the single row of burners without striking. This car was turned by an endless rope passing over pulleys and first pulled in one direction and then the reverse. The scrapers were held against the plates by wire springs and were only in contact with the place when passing toward the end at which the receptacles were removed. The dome was a surplus adjunct. Cast iron was better than soapstone, and there was no need of water cooling. Indeed, Mr. Howarth never used water cooling on a commercial scale. Obviously its effect would hardly be felt through such a non-conductor as soapstone.

The first factory was located at New Cumberland, W. Va., and the gas came from what is known as the salt sand and was very rich in carbon and made an excellent black. The factory was made of wood and before long it burned down and the business was removed to Saxonburg station, Pa. In two or three years competition sprang up at Gambier, Ohio, where a small factory was erected by Mr. Peter Neff, who made black by a somewhat similar process for something like 10 or 12 years. He has as many patents for carbon black apparatus as all other inventors put together or thereabout, but most of them were fantastic and useless. His factory reached an output at one time of 125 pounds per day.

The next important competition was by Mr. A. V. Nolen, who in the year 1879 built a factory at New Cumberland, W. Va., and made black on cast iron pans holding water. By this time the price of black had gone down to about 60 cents per pound, but nevertheless where two pioneers had met with little pecuniary success, Mr. Nolen by superior ability made a good deal of money and bought out the original company. Various other small factories were started from time to time, but it was not until the year 1883 that any considerable advance was made, when the firm of L. Martin & Co., of Philadelphia became interested in a small and struggling enterprise at Foster's Mills, Pa., and there erected five plates 24 feet in diameter, cast in segments and suspended on a central

mast, which rotated with it upon the bronze bed plate. Beneath this was fixed a stationary burner of parallel horizontal iron pipes 1¼ inches in diameter branching from a central supply 3¾ inches inside diameter, and this in turn connected suitably with the well.

Incredible as it may seem even at this time, after 10 years of experience, no attempt had been made by any of these three leading manufacturers to control the flow of gas from the wells, although this was then quite possible with available appliances and a blazing torch at each natural gas well, wasting millions of feet was a feature at the principal factories, including that at Foster's Mills, Pa. About the same time a factory was started by Godfrey L. Cabot, a Boston man, in the adjacent village of Worthington, at which some efforts to confine and economize the gas were made, but remained in a large part fruitless for some years, owing to the inefficiency of the foreman. At the factory at Foster's Mills the idea of a traveling box scraper was discarded and a plan for the first time successfully adopted on a commercial scale of a horizontally rotated collecting surface. The same principle was adopted at Worthington, at about the same time, but failed of success, owing to purely mechanical imperfections. At first blush it would seem as if the original idea of moving only the scraper box was the correct principle, and yet it is now entirely abandoned and about one-half of all the black that is made today is made on surfaces which are moved over a stationary scraper box and stationary burners.

The first decade of the manufacture of carbon black from natural gas on a commercial scale was the epoch of factories in which the collecting surfaces were arranged in rectangular shapes placed end to end to form what the workmen call benches. The details whereby the black was collected, the dimensions of the different parts and the arrangement of the size of the burners varied in different factories. But four-fifths of all the black made was made on benches and the rest was made on the external surfaces of rotating cylinders. Various efforts were made to use petroleum oil and the firm of Carnahan & Swan, of Duke's Center, Pa., made a very fine black by this method for several years.

Various other manufacturers of carbon black tried to use oil and were tempted thereto by the greater amount of black deposited by a flame of given size on a given surface, but one and all of them found it unprofitable, owing to the great expense of oil and the danger of fire. which increased very greatly with any increase in size of the apparatus. An apparatus which worked perfectly well on a laboratory scale was quite unsafe on a commercial scale. At the end of this epoch Mr. A. V. Nolen was the largest manufacturer and the total output was probably ten hundred to fifteen hundred pounds a day. The year 1883 brought with it the introduction of large stationary plates, which replaced at Foster's Mills a factory in which benches had been used. A scraper box and scraper were placed radically, so that in revolving the scrapers faced direct against the direction at which the surfaces passed across them. The black was removed by a screw conveyor in the bottom of the scraper box, which carried it outward to a longer conveyor, which ran tangential to a row of five plates and carried the black to a rotating bolt through which it went into the bin. It was then lifted from the bin by hand in large scoops and packed by hand with a screw press. but the black is very light and the handling of it was very dirty, unhealthy work, involving considerable loss in raw material. In the earlier factories it had been the habit to brush the black through a fine horizontal sieve by means of brushes rotating on a vertical axle, a bolt revolving on a horizontal axis, which discharged the coarser particles of black at one end and allowed only the finer particles to fall through, it was a decided improvement. In the same year a very able young man named A. R. Blood, of Warren, Pa., devised a method in which a small plate about three feet in diameter was used. The advantage of this was that no ventilation holes were needed, as in the case of the larger plates, excepting, however, that this small plate was cast in the form of a ring with an opening in the center. This plate was moved by means of a ratchet at the center. This ratchet was worked by a lever and this by another lever revolved on a shaft. Every time the shaft came around it would give the plate a little shove, which would move it an inch or so. Beneath the plate was a scraper in the mouth of a vertical slot, through which the black fell into a longitudinal conveyor running beneath the row of plates. There were 14 plates in a row and six rows in the building. The buildings were of sheet iron on a frame work of pipe and angle iron, and were pierced with small holes near the bottom to give the needful supply of air. Along the ridge pole was an opening about 30 inches wide and about six inches above this a little pent roof to prevent the entrance of rain. The space between was something like six inches through which the products of combustion passed. All of these factories used gas jets, either of iron or stealite, such as are ordinarily used in houses. There was one factory which used argand burners, but did not last many years. About this same year the father of this A. R. Blood began making black on the roller process and using a burner with a small hole in the point of the tip, giving a round flame. This black was at first very unprofitable owing to the small yield, but the successors of Mr. E. R. Blood improved the details of manufacturing and experience has shown this black to possess very valuable qualities, and it sells for a high price, and is profitable to the owner, the Peerless Carbon Black Company, of Pittsburg, Pa.

This company was for many years the only company making carbon black in this country from natural gas on revolving cylinders, although in the earlier days there were two or three factories on this principle. At the present day over one-half of the carbon black is made by the revolving cylinder process.

In the second decade the process of making carbon black introduced by Mr. E. R. Blood became the most important as to output and the total value of black produced. The prices of black fell rapidly and reached seven cents a pound by the year 1887, and three cents a pound by 1888. After this there was a considerable improvement in prices, followed by a further rapid increase in the output, and by the close of the second decade the total output had reached about 10,000 pounds per day, worth at that time about six

cents per pound, on an average. Toward the end of the second decade two new processes began to become an appreciable factor in the total output. The first of these was the process whereby, under 24-inch plates similar to those previously mentioned, though varying somewhat in details, was rotated a burner and black box radically placed. The burner was made up of parallel 1¼-inch pipe inserted in a central supply pipe 3¾ inches in diameter. As first used by the radical black box discharged into a hopper placed at the side of the plate by means of a little trap door with a lever, which was pressed in such a way as to open the trap door every time it passed over the hopper, and after the discharge the trap door closed again by means of a counter poise. This method of a rotary burner was introduced at Worthington somewhere about the year 1884, but did not become a commercial success until the year 1887. The factory changed hands and the new owner changed the method to that of a central discharge, whereby the black was continuously discharged by a vertical spout at the inner end of the radical black box into a circular ring shaped box, where it fell through a trap door into a long conveyor. By the former method the longitudinal conveyor had been tangent to the rings and by this it went within two feet of the center. A cover was hung above this round box in such a way as to exclude air and rotate with the burners, black collecting box, etc. The bottom of the vertical spout above alluded to pushed the black in front of it, as it slowly swung around the ring until it reached the orifice through which the black fell. One great advantage of this method was that the black was not exposed to the air. By the former method whenever the box emptied a cloud of black arose, making a nuisance and a great loss of output. As rebuilt the black was kept under cover and carried to a bolt also shut in and lifted from beneath this bolt in an elevator into a bin. From this bin it was packed by machinery in either sacks or barrels, always under cover, so that from the time the black was made until it was used by the consumer it was never touched by hand and was always under cover and protected from all appreciable drafts of air.

The other process above referred to was introduced about the year 1891 at a place called Gallagher, Pa. and consisted of a system of channel beams turned with flat side downward over horizontal rows of stationary burners and black boxes. By a reciprocating mechanism these beams are slowly moved back and forth, and the black is scraped and removed by a screw conveyor in the usual manner. The chief advantage of this system is the perfection of the surfaces, which are better than the surfaces of cast iron plates.

In the beginning of the third decade of this industry another attempt was made to manufacture carbon black with the help of petroleum and under a somewhat new principle by evaporating petroleum and burning it over through gas burners. The cost of making this black was probably less than that of any other black made from petroleum oil by the contact process, still much more than could be realized by its sale. One great difficulty was the formation of adamantine carbon in the black. These particles were so hard that they would scratch glass and the manufacturer was unable to discover a method of removing it. Since that time there has been no carbon black made from oil on a commercial scale in this country, although there is a small amount of a very expensive grade made in Europe from what are known as gas oils, a heavy oil obtained in the distillation of shale and chiefly used by manufacturers of illuminating gas. No important improvement in carbon black making has appeared in the third decade just drawing to a close. The output has steadily increased, and is now over 25,000 pounds a day.

The price has fluctuated a good deal, the average for the decade is about six cents. The amount of black produced with rotating burners and with the reciprocating channel has very considerably increased, there have also been detailed modifications of the principle of the small stationary plate, the amount made on this general principle has also increased. At the present time about 12,200 pounds of carbon black are made with rotating burners, and something like 1,500 pounds with reciprocating channel beams, and 10,800 pounds on stationary cast iron plates, mostly with the smaller sizes. There is only one factory in existence which operates on the bench principle and has a capacity of 500 pounds daily.

The largest carbon black factory in the world is located at Cabot, three miles east of Grantsville, county seat of Calhoun county, W. Va., on the Little Kanawha river. The factory has 115 rings in operation and others building. The rings are made to revolve in a circle by an endless chain elevator, operated from the power house. The rings are 23 feet in diameter and nine feet high. Enclosed in a round sheet iron house in the center of each house a stone pillar is built. On the top of the pillar is bolted an 8-horned ball bearing casting, with a 3¾-inch center pipe feed line passing through the center. This supplies the gas to the burner pipes, which are 1¼ inches in diameter, with burner pipes 26 on one side of the ring and 27 burner pipes on the other side, with 1,200 jets burning under each ring. The ring is supported by eight 2-inch pipe legs, with the lower ends connected with the horned casting and the upper ends bolted to the ring five feet from the center. The conveyor or catch pan takes the place of one burner pipe and passes the black to the center conveyor, which runs beneath the center of each ring house. The conveyors are 4, 5½ and 6 inches in size, round on the bottom and flat on the top. The conveyors convey the black to the bolter house, then to the packing house, where the black is packed in 12½ pound sacks, 75-pound barrels, and in boxes of 150 pounds. The gas is supplied to the factory from seven gas wells located on Leaf Bank creek, two miles northwest of Grantsville; a 6-inch pipe line connects the wells to the factory. The capacity of this factory is 6,000 pounds of carbon black daily.

Carbon black factories are located at Weston, Smithburg, West Union, Bristol and Wilsonburg, W. Va.; Saxonburg station, Worthington, Sunset, Ridgeway, Wilcox, Kane, Wetmore and Duke Center, Pa.; two factories are located in Ohio, four in Indiana and two in Kentucky.

The combined output of all the factories is 25,000 pounds of carbon black daily. The carbon black is shipped to New York, Chicago, Boston, Baltimore,

Philadelphia, Pittsburg, Milwaukee and San Francisco.

All the leading newspapers in the world are printed with ink made from carbon black, paints, stencil black, shoe blacking, harness blacking and dyes are also made from carbon black. The present price of carbon black is five cents a pound.

A modern carbon black plant, irrespective of the gas, would cost in the neighborhood of $50,000 or $60,000. This is outside of any royalty that would have to be paid for patents.

THE LAW

In the Several Oil and Natural Gas Producing States Regarding the Plugging of Oil, Natural Gas, Salt and Mineral Water Wells.

Before abandoning, in all of the states where oil and natural gas is found, there are special laws concerning the plugging and sealing of abandoned wells. These laws should be carefully observed by all companies and operators, as the penalties for violations are very large, in some cases being $1,000 fine and six months imprisonment.

PENNSYLVANIA.

The laws of the commonwealth of Pennsylvania regarding the plugging of oil, natural gas, salt and mineral water wells.

In the past years it was the practice when oil wells ceased to produce oil in paying quantities to pull the casing out and abandon the well without properly plugging the hole. That is, the hole is left open instead of being plugged above the oil producing sands with wooden plugs and sediment to keep the surface water from running down the hole to the oil producing sands and spreading itself indefinitely until it reaches other wells in the same sand and they begin to pump water with the oil and in a short time the surface water will flood the sand and ruin the well. This is so important a matter to the general welfare of the oil producing regions that a law has been enacted making it a misdemeanor for a company to abandon a well and leave it unplugged. The penalty is two hundred dollars ($200) for each offence, one half to go to the informer and one half to be turned into the fund for the use of the public schools in the district where the well is situated. The enactments are those of the commonwealth of Pennsylvania enacted May 16, 1878 and June 10, 1881.

"Oil wells to be plugged.

16 May, 1878, Sec. 1 (P. L. 56).

All owners of and operators of oil lands within this commonwealth, shall in a practical manner plug their wells, at proper depth, with wood and sediment, in a manner sufficient to exclude all fresh water from the oil-bearing rock, and to prevent the flow of oil or gas into the fresh water.

"Penalty for omission. Ibid. Sec. 2.

Any person found guilty of violating the provisions of this act shall be fined in any sum not less than $20 nor more than $100 for each and every offense; which shall be paid, one half to the informer and the other half to the school district in which the offense is committed, which shall be collected as fines of like manner are by law collected.

"Powers of adjoining owners in case of neglect. Ibid. Sec. 3.

Whenever the owner of any well has abandoned the same or does not reside in the county in which it is situated, any person owning property adjoining may enter in and take possession of any well, for the purpose of carrying out the provisions of the first section of this act, where the owner has refused or neglected to plug said well so as to shut off the fresh water from the oil rock and exclude the gas and oil from the fresh water, as provided in section first, at the expense of the owner.

"How abandoned wells to be plugged.

10 June, 1881, Sec. 1 (P. L. 110.)

Whenever any well shall have been put down for the purpose of exploring for any producing oil, upon abandoning or ceasing to operate the same, the owner or operator shall, for the purpose of excluding all fresh water from the oil bearing rock, and before drawing the casing, fill up the well with sand or rock sediment to the depth of at least 20 feet above the third sand or oil bearing rock, and drive a round, seasoned, wooden plug at least two feet in length, equal in diameter to the diameter of the well below the casing, to a point at least five feet below the bottom of the casing, and immediately after the drawing of the casing, shall drive a round wooden plug into the well, at the point just below where the lower end of the casing shall have rested, which plug shall be at least three feet in length, tapering in form, and to be of the same diameter at the distance of 18 inches from the smaller end as the diameter of the well below the point at which it is to be driven; (and) after it has been properly driven, shall fill in on top of same with sand or rock sediment, to the depth of at least five feet.

"Penalty for neglect. Ibid. Sec. 2.

Any person who shall violate the provisions of the act shall be liable to a penalty of $200, one half to be for the use of the informer, and one half to the use of the school district in which such well may be situated, to be recovered as debts of like amount are by law recoverable.

"Powers of adjoining owners. Ibid. Sec. 3.

Whenever any owner or operator shall neglect or refuse to comply with the provisions of (this) section one of this act, the owner of, or operator upon any land adjoining that upon which such abandoned well may be, may enter, and take possession of said abandoned well, and plug the same as provided by this act, at the expense of the owner or company whose duty it may be to plug the same.

GENERAL CORPORATION LAWS.

CODE OF WEST VIRGINIA.

Requirements Concerning Abandoned Gas, Oil, Salt Water or Mineral Water Wells.

This chapter is the same as chap. 58, acts of 1897.

WELLS MUST BE ENCASED.

1. When any well shall be drilled for the production of petroleum oil, natural gas, salt or mineral water, it shall be the duty of the owner thereof before drilling said well into the oil and gas sand to encase such well with good and sufficient wrought iron, steel or metal casing, in such manner as to exclude and shut out all surface water, salt water, or fresh water, and to prevent the same from reaching or penetrating said oil and gas sand.

HOW WELL TO BE PLUGGED.

2. It shall be the duty of the owner of any well drilled for any of the purposes mentioned in the first section of this act before abandoning or ceasing to operate the same, and before drawing the casing therefrom, to fill up the well with sand or rock sediment to a depth of at least 50 feet above the top of the oil or gas bearing sand or rock and drive a round seasoned wooden plug, at least three feet in length, equal in diameter to the diameter of the well below the casing, to a point at last five feet below the bottom of the casing; and immediately after drawing the casing, except in regions where the well caves after the withdrawal of the casing, shall drive a round seasoned wooden plug at a point just below where the lower end of the casing rested; which plug shall be at least three feet in length, tapering in form, and of the same diameter at the distance of 18 inches from the smaller end as the diameter of the hole below the point at which it is to be driven. After the plug has been properly driven there shall be filled in on top of the same, sand or rock sediment to the depth of at least 50 feet above the top of the gas bearing sand or rock.

WHEN GAS WELLS TO BE SHUT IN.

3. It shall be the duty of any owner of any well producing gas, to prevent the waste of said gas by escape, and within the time hereinafter limited, to shut in and confine the same in said well or in the pipes or pipe lines connected therewith. Said gas, with respect to any well heretofore drilled, shall be so shut in within 90 days after the approval of this act, and with respect to any well heretofore drilled or completed, shall be shut in within 90 days after the said well shall reach the lowest oil and gas sand defined or recognized in the gas or oil district in which said well is situated; but if any such well in the course of drilling shall pass through any oil and gas sand which produces gas above the said last or lowest oil and gas sand then the drilling of said to the last or lowest oil and gas sand shall be prosecuted with reasonable diligence, so that any waste of gas from the said upper sand shall not continue longer than shall be reasonably necessary; provided, however, that this section of this act shall not apply to any well producing both oil and gas from the same sand, or to any well while it is being operated as an oil well.

WHO MAY PLUG WELL IF OWNER FAIL.

4. If the owner of any such well shall neglect or refuse to cause said well to be plugged or shut in pursuant to the provisions of the second and third sections of this act, for a period of 20 days after written notice so to do (which notice may be served personally upon such owner, or may be posted in a conspicuous place at or near the well), it shall be lawful for the owner or operator of any adjacent or neighboring lands to enter upon the premises where said well is situated and to cause the same to be plugged if it be an abandoned well or shut in if not abandoned pursuant to the provisions hereof; and the reasonable cost and expenses incurred in so doing shall be paid by the owner of said well, and may be recovered as debts of like amount are by law recoverable.

WHO DEEMED OWNER.

5. The term "owner," as herein used with reference to any well, shall mean and include each and every person, persons, copartnership, association or corporation owning, managing, operating, controlling or possessing said well as principal or principals or as lessees, contractors, employes, or agents of such principal or principals; and the terms "oil and gas sands," or "sand," as herein used shall mean and include any bed, seam or stratum of rock, sand or other material which produces, yields, or contains in quantity, sufficient to be utilized, petroleum oil and natural gas or either of them.

PENALTIES.

Any person or persons, copartnership, partnership, association or corporations violating any of the provisions of this act shall be liable to a penalty of $100 to be recovered with costs of civil action to be brought in the name of the state of West Virginia in any circuit court, and such action may be brought at the instance and upon the relation of any citizen of the state.

REMEDY IN EQUITY.

7. Aside from or in addition to the imposition of any penalties under this act, it shall be the duty of any circuit court in the exercise of its equitable jurisdiction to hear or determine any bill or bills in equity which may be filed to restrain the waste of natural gas in violation of this act, and to grant relief by injunction or by other decrees or orders, in accordance with the principles and practice in equity. The plaintiff in such bill shall have sufficient standing to maintain the same if he shall aver and prove that he is interested in the lands situated within the distance of one mile from said well, either as an owner of such land in fee simple, or as an owner of leases thereof, or of rights therein, for the production of oil and gas, or either of them.

ACTS REPEALED.

8. All acts or parts of acts inconsistent herewith are hereby repealed.

LIMITATIONS OF ACTIONS ON OIL OR MINERAL LEASES.

Any person or persons in peaceable possession of land claiming title under a lease of the same for the purpose of operating for oil or minerals, and who may have continuously remained in such possession for the space of three years, and have bored for, and in good faith expended money in such boring and operating, shall be entitled to plead said facts in bar, and said facts shall be a bar to any action at law, or in equity, instituted to establish title to recover possession of said lease, or to recover the profits received therefrom; *provided*, that nothing in this act contained shall be so construed as to authorize a tenant to set up as a bar to a recovery an adversary possession against his landlord, and that this act shall not affect any suit brought within twelve months after the passage of this act.—[1872-3 Acts 61; Code 1899, page 1113.]

DEPARTMENT OF MINES AND MINING.

STATE OF OHIO.

OFFICE OF CHIEF INSPECTOR OF MINES. COLUMBUS, O.

OIL AND GAS WELL RECORD.

The method of sealing.....Well
No....., located on land of.....
.....
Section No...., in.....Tp.,
..... County.
The property of.....
Whose P. O. address is.....
Under the management of.....
.....
Whose P. O. address is.....

OIL AND NATURAL GAS LAWS PASSED BY THE LAST GENERAL ASSEMBLY OF THE STATE OF OHIO.

[House Bill No. 125.]

AN ACT

To amend sections 306-1, 306-2, 306-3, 306-4, and 306-5, and to repeal sections 306-5a, 306-5b, 306-5c, 306-5d, 306-5e and 306-6 of the Revised Statutes of Ohio.

Be it enacted by the General Assembly of the State of Ohio:

Section 1. That sections 306-1, 306-2, 306-3, 306-4, and 306-5 of the Revised Statutes of Ohio be amended so as to read as follows:

Sec. 306-1. It shall be the duty of every person, firm or corporation engaged in drilling or exploring for natural gas or oil upon any land from which coal is being mined upon notice from the chief inspector of mines of the State of Ohio, or from any district inspector of mines of said State, to make or cause to be made, an accurate map thereof, which shall show the boundaries of each tract of land drilled upon, and the buildings and all monuments found upon such premises. Each well shall be plainly marked by a name, number or letter, and located whenever possible with reference to some well defined and lasting monument, so that its exact location may be determined. Such map shall contain a sworn statement of the person, firm, or corporation operating such oil or gas wells, that it is a true and accurate representation of the property; and a copy thereof shall be filed in the office of the chief inspector of mines and be open to inspection at all reasonable times.

Sec. 306-2. It shall be the duty of every person, firm or corporation leasing any land for coal mining purposes, and upon which gas or oil wells have been drilled to, or below any veins or seams of such mineral coal before proceeding to mine such coal to make, or cause to be made, and filed in the office of the chief inspector of mines such a map as is described in section 306– of the Revised Statutes of Ohio.

Sec. 306-3. Whenever any person, firm or corporation sinks any well for gas or oil on lands upon which coal or other mineral is being mined, and which well passes through any mine, it shall be the duty of the person drilling such well to drill the hole to a depth of at least ten feet below the vein of coal or other mineral being mined, when such hole shall be cased and sealed upon the outside of the casing, with suitable material to the level of the coal floor; and each vein of mineral coal being mined, pierced by such well shall be sealed in same manner.

Sec. 306-4. It shall be the duty of the owner of any well drilled for gas or oil and which in drilling shall have passed through any vein of mineral coal, before abandoning, or ceasing to operate such well, and before drawing the casing therefrom, to seal the same in the manner following: There shall be driven in such well to a depth of at least ten feet below the floor of the lowest coal measure a round seasoned wooden plug at least three feet in length and equal in diameter of the well at that point, on the top of which plug there shall be filled at least seven feet of sidement or drillings, or cement and sand. Where any gas or oil well passes through any gas or oil bearing rock lying above the coal measures, the owner of said well or his agent, shall, upon abandoning or ceasing to operate such well, drive a dry wooden plug not less than two feet in length, equal in diameter to the diameter of the hole, to a point as near as possible to the top of the coal vein, on the top of which plug there shall be filled at least five feet of sediment or drillings, or cement and sand, as the mine inspector shall direct.

In case such well is not plugged as aforesaid within ten days from the abandonment thereof, the chief inspector of mines, or a district inspector of mines, may

cause the well to be plugged, and the costs and expenses of such plugging may be recovered of the person, firm or corporation whose duty it is to plug the same in the manner provided for the recovery of penalties by section 303-5 of the Revised Statutes of Ohio.

Sec. 306-5. Every person, firm or corporation, failing to comply with any of the provisions of this act, shall be subject to a penalty of not less than one hundred dollars, nor more than two hundred dollars, to be recovered by action in the name of the state, and on collection, paid into the treasury of the state to the credit of a fund which is hereby appropriated for prosecuting violations of this act, to be paid out on requisition signed by the chief inspector of mines. Such action may be instituted in the court of common pleas of the county wherein any such well is located, or of Franklin county. In addition to the penalties herein provided, any person deemed guilty of a misdemeanor, and on conviction, be fined in any sum not less than fifty dollars nor more than two hundred dollars, or be imprisoned not less than ten days nor more than thirty days, or both.

Sec. 2. Said original sections 306-1, 306-2, 306-3, 306-4, 306-5, 306-5a, 306-5b, 306-5c, 306-5d, 306-5e, 306-6 of the Revised Statutes of Ohio be and the same are hereby repealed, and this act shall take effect and be in force from and after its passage.

W. S. McKINNON,
Speaker of the House of Representatives.

CARL L. NIPPERT,
President of the Senate.

Passed April 3, 1903.

LAWS OF PRIVATE CORPORATIONS OF THE STATE OF INDIANA.

THE LAW REGARDING PLUGGING ABANDONED OIL, NATURAL GAS AND ARTESIAN WELLS.

Sec. 651. *Plugging Abandoned Wells.*. 2. Whenever any well shall have been sunk for the purpose of obtaining natural gas or oil or exploring for the same, and shall have been abandoned or cease to be operated for utilizing the flow of gas or oil therefrom, it shall be the duty of any person, firm or corporation having the custody or control of such well at the time of such abandonment or cessation of use, and also of the owner or owners of the land wherein such well is situated, to properly and securely stop and plug the same as follows: If such well has not been "shot" there shall be placed in the bottom of the hole thereof a plug of well-seasoned wood, the diameter of which shall be within one-half inch as great as the hole of such well, extend at least three feet above the salt water level, where salt water has been struck; where no salt water has been struck such plug shall extend at least three feet from the bottom of the well. In both cases such wooden plugs shall be thoroughly rammed down and made tight by the use of drilling tools. After such ramming and tightening the hole of such well shall be filled on top of such plug with finely broken stone or sand, which shall be well rammed to a point at least four feet above the Trenton limestone, or any other gas or oil bearing rock; on top of this stone or sand there shall be placed another wooden plug at least five feet long with diameter as aforesaid, which shall be thoroughly rammed and tightened. In case such well shall have been "shot," the bottom of the hole thereof shall be filled with a proper and sufficient mixture of sand, stone and dry cement, so as to form a concrete up to a point at least eight feet above the top of the gas or oil bearing rock or rocks, and on top of this filling shall be placed a wooden plug at least six feet long, with diameter as aforesaid, which shall be properly rammed as aforesaid. The casing from the well shall then be pulled or withdrawn therefrom, and immediately thereafter a cast-iron ball, eight inches in diameter, shall be dropped in the well and securely rammed into the shale by the driller or owner of the well, after which not less than one cubic yard of sand pumping or drilling taken from the well shall be put on top of said iron ball. (R. S. 1897, sec. 7888; R. S. 1901, sec. 7511.)

[1899, p. 82. Approved February 22, 1899. In force April 28, 1899.]

Sec. 652. *Penalties.*. 3. Any person violating any provisions of this act shall be guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than twenty dollars nor more than two hundred dollars, to which may be added imprisonment in the county jail not less than ten days nor more than sixty days; and each day during which such violation shall continue shall constitute a separate offense. (R. S. 1901, sec. 7512.)

[1893, p. 300. Approved March 4, 1893. In force May 18, 1893.]

Sec. 653. *Liability.* 4. Whenever any person or corporation in possession or control of any well in which natural gas or oil has been found shall fail to comply with the provisions of this Act, any person or corporation lawfully in possession of lands situated adjacent to or in the vicinity or neighborhood of such well may enter upon the lands upon which such well is situated and take possession of such well from which gas or oil is allowed to escape in violation of the provisions of section one of this Act, and pack and tube such well and shut in and secure the flow of gas or oil, and maintain a civil action in any court of competent jurisdiction in this State against the owner, lessee, agent or manager of said well, and each of them jointly and severally, to recover the cost and expense of such tubing and packing, together with attorney's fees and cost of suit. This shall be in addition to the penalties provided by section three of this Act. (R. S. 1897, sec. 7890; R. S. 1901, sec. 7513.)

Sec. 654. *Expense of Plugging, Liability for.* 5. Whenever any person or corporation shall abandon or cease to operate any natural gas or oil well, and shall fail to comply with the provisions of section two of this Act, any person or corporation lawfully in possesion of lands adjacent to or in the vicinity or neigh-

borhood of such well may enter upon the lands upon which such well is situated and take possession of such well, and plug and fill the same in the manner provided by section two of this Act, and may maintain a civil action in any court of competent jurisdiction of this State against the person, persons or corporations so failing, jointly and severally, to recover the costs and expense of such plugging and filling, together with attorney's fees and costs of suit. This shall be in addition to the penalties provided by section three of this Act. (R. S. 1897, sec. 7891; R. S. 1901, sec. 7514.)

HISTORY OF THE ORIGIN AND THE METHOD OF TUBING AND RODDING OIL WELLS FOR PUMPING.

The first pumping oil wells were on Oil Creek in Pennsylvania, and they were modeled after the system of pumping salt brine wells at the Kanawha Salt Works near Charleston, West Virginia. When wells are first drilled some are flowing wells, some are small wells which have not gas enough to make them flow, while a number of the wells drilled are dry holes. The small wells and also the large ones when they have not gas enough to make them flow are tubed, rodded and put to pumping. All the wells are tubed with 2-inch tubing, except those that pump more salt water than oil, for example the hundred foot oil field in Butler county, Pa., the Sistersville oil field in West Virginia, and the Salt water wells in the Lima, Ohio, and Indiana oil fields. Those wells are tubed with 2, 3, and 4 inch tubing. A pumping well is tubed as follows: First the rope or wire tubing line is run over the derrick, one end is tied to one of the arms in the bull wheel and coils on the bull wheel shaft on the other end of the tubing line. A tubing hook is tied, then a short piece of tubing, with a plug drove in the end, which is used for anchor is screwed into a perforated tubing nipple, which has 15 to 30 quarter-inch holes drilled or punched in it. To let the oil inside of the tubing and a long nipple or whole joint of tubing is screwed on. A tubing elevator is put on under the collar of the tubing; the hook is placed in the reins of the elevator, the tubing is pulled up in the derrick and backed down into the hole until the tubing elevator rests on the casing head. The hook is unhooked from the elevator, the second elevator is put on under the collar of the working barrel, in the bottom of the working barrel is a seat for the standing valve to rest on. The standing valve is six to eight inches in length and one and three-quarter inches in diameter, with three-quarter inch hollow tube running through the center, with yoke bottom, 22 round leather rings, ball and seat and cage top. After the working barrel is lowered into the hole, the elevator is put under the collar of a joint of tubing and is pulled up in the derrick, and screwed into the top of the working barrel and lowered into the well. Then joint after joint of two-inch tubing from 18 to 24 feet long is screwed together and lowered in the well, one joint at a time, until the weight of the tubing gets too heavy for a single line. The tubing line is doubled up and the tubing block is used until the anchor or lower end of the tubing strike the bottom in the well, when the tubing is raised up so as to have the anchor suspended from the bottom 18 or 20 inches. The tubing is marked even with the tubing ring on the casing head at the mouth of the well. It is then pulled up to the next joint below the marked joint. The joint is either cut off or a short piece of tubing is used in its place after the tubing ring is put on and packed the tubing is anchored on the casing head. The next thing to do is to screw a two-inch T and nipple about one foot long in the collar of the tubing above the casing head, and from the two-inch T connect the well with a two-inch line to the tank. Take down the tubing line and put up a single rod line and tie one end to one of the arms of the bull wheel and then tie a rod hook on the other end of the rod line with a single bowline knot. The working valve which is 12 to 15 inches long, 1¾ inches in diameter with a ¾ inch hollow tube yoke bottom and cage top with four leather cups. Seat and ball is screwed to the ⅝ four-foot long iron valve stem. The sucker rod elevator is placed on the square under the pin of a hexagonal wooden sucker rod from 20 to 24 feet long, 1⅝ inches in diameter with iron strap pin and box joints. The valve and stem are screwed to the rod, pulled up in the derrick and lowered down into the tubing. Another rod is pulled up in the derrick and screwed on to the rod resting on the elevator on the tubing. One rod after another is screwed together and lowered into the tubing until the working valve strikes the standing valve in the bottom of the working barrel in the well. The rod is marked even with the two-inch T above the casing head and is pulled up and rested on an elevator. The long rod is unscrewed and taken off and a sub is screwed on. The polish rod, stuffing box, stand pipe and adjuster are pulled up and screwed on to the rods which are then lowered until the working valve rests on the standing valve. A string is then tied on the polish rod above the stuffing box; the rods, polish rod and adjuster is pulled up about 18 inches, the bull rope is thrown off and the wrist pin is put in the second hole of the crank. The crank is then stopped on the upper center, the walking beam is raised up by the pitman, the lower end of the pitman is coupled to the wrist pin, the stand pipe is screwed into the T and the polish rod is then placed in the slot of the beam and let down until the adjuster rests in the seat of the beam and bolted fast to the polish rod. The adjuster board and T bolt are then put in place and bolted down. This keeps the adjuster in its place on the walking beam, and leaves the valves about 15 inches apart in the working barrel. The working barrels are six feet long and 1¾ inches in diameter. The engine is now started and the walking beam is kept in an up and down motion which raises and lowers the rods and working valve in the barrel 15 to 18 inches. The cups on the working valve fit tightly in the working barrel, and the up and down motion of the walking beam causes a vacuum or suction in the working barrel. The band wheel and crank revolve in a circle, and as the pitman and walking beam change from the upper to the lower center the rods and working valve are raised in the working barrel and the oil is sucked up through the standing valve. Then the pitman and

beam change from the lower to the upper center, forcing the working valve down in the working barrel and as the working valve starts on the down center the ball drops in the seat of the standing valve and holds the oil from going back into the well. This forces the oil up through and above the ball and seat in the working valve and as the latter goes up the ball drops back in the seat of the working valve and holds the oil, while the cups and working valve cause a suction between the two valves which sucks more oil up through the standing valve and as the working valve again starts to go down in the working barrel the ball drops in the seat of the standing valve, forcing the oil up through and above the ball and seat in the working valve. Each revolution of the band wheel and crank sucks and raises the oil in the tubing until the space between the rods and tubing is filled up to the top of the hole. The oil is then forced through the lead line to the tank. Some wells pump a steady, small stream of oil, while the majority of wells pump by head, all the oil in the hole down to the perforated pipe. This is called pumping the head off. The head may be 1, 2, 3, 4, 5 or 10 barrels. Head wells are usually pumped every day except Sunday. Where gas pumps are used or in salt water oil fields the pumping wells are run regularly night and day.

MEASURING WELLS.

HOW OIL WELLS ARE MEASURED.

At the beginning of drilling a well a record or log is kept of the different kinds and thickness of drilling or strata drilled through and the number of feet of conductor, drive pipe and casing used in the well. The method of measurement used at all drilling wells where cables are used is the same. It is done by letting the bit or drill down even with the derrick floor, then one end of a five foot measuring stick is placed on the derrick floor below the bull wheel shaft in a perpendicular position, that is to say straight up and down from the derrick floor to the cable running from the bull wheel shaft up to and over the crown pulley on top of the derrick and down to the tools. A string is tied on the cable at the top of the measuring stick at the bull wheel shaft. The driller eases the brake on the bull wheel by raising the brake lever, which allows the bull wheel to revolve and unwind the cable, letting the tools in the hole. As the cable unwinds from the bull wheel the string runs up to and over the crown pulley and down to the hole. As the string nears the floor the driller checks the bull wheels by lowering the brake lever which stops the string even with the floor at the hole. Another string is tied to the cable at the bull wheel shaft five feet above the derrick floor. The string is then taken off the cable at the hole. The tool-dresser places his right hand in a strap which is attached to the middle of the measuring stick and with his left hand he takes hold of the cable with his thumb under the cap rubber on the upper end of the measuring stick five feet above the hole. This is done for a mark. Then with the right hand he removes the stick from the cable and clear from the hole. This done the driller eases the brake by raising up the lever and allowing the bull wheels to unwind and leave the tools and cable run into the hole until the tool dresser's thumb reaches the floor. The right hand with the stick is placed against the cable with the lower end of the stick resting upon the thumb of the left hand. This is called hand-over-hand measure and is repeated until the second string which was tied on the cable at the bull wheel shaft goes up to and over the crown pulley on top of the derrick and down to the hole on the derrick floor. The distance between the two strings on an 82-foot derrick is about 32 sticks. Each stick measures five feet (or 160 feet from the bull wheel shaft) over the derrick and down to the hole. The five feet between the derrick floor and the bull wheel shaft is not counted. The drillers and tool dressers keep a record of the wells by tying a string (called derrick string) on the cable. As the drilling progresses, or, in other words, as the hole is drilled deeper it requires more cable and as each string reaches the hole another is tied on at the shaft. Then the one at the hole is taken off. This is called "stringing over." Each string is numbered 1, 2, 3, etc. The space between each string on an 82-foot derrick is about 160 feet; for example, the first string is 160 feet, the second is 320, the third 480 and so on. Ten strings would make the well 1,600, and fifteen strings would make the well 2,400 feet deep. The records of the wells southwest of Pittsburg, Pa., are governed by the seam of the Pittsburg coal. For example, a well is located where the Pittsburg coal crops out. The Gordon sand is from 5 to 100 feet in thickness and is found from 2080 to 2100 feet below the Pittsburg coal. The fourth sand is from 4 to 30 feet in thickness and is found 2140 feet below the Pittsburg coal. The fifth sand (the deepest oil producing sand) is from 5 to 25 feet in thickness and is found 2201 feet below the Pittsburg coal. If oil or gas is found in any of the sands the well is measured by a flat steel line modeled after the clock spring. This is done to get an accurate measurement of the well. It should be remembered that cable measure is not accurate, since no two cables stretch or take up alike.

The steel line is coiled on an adjustable small reel, which is attached to an iron frame attached to the fly or balance wheel of the engine in the engine house. The end of the line passes along the walk into the derrick ,where it passes over a small pulley attached to the drilling stem or bailor. On the end of the measuring line is fastened a small iron weight. Then the weight and line are let down the hole by unwinding the reel in the engine house. When the weight has been run down near the bottom of the well, the line is unwound and sprung down to the bottom by hand. When the weight strikes the bottom of the well it makes a jar on the line, which is felt by the man springing the line at the top of the hole. The line is tightened up to where the jar picks up even with the hole, when a small string is tied to the line and measured back to the first 50 or 100 foot mark on the line with a five foot stick. The first 50 feet of the line is stamped 50 feet. The second 50 feet is stamped 100, and the third 150, and so on. The lines

are from 1,000 to 3,700 feet long. The steel measuring lines are pulled out of the hole by locking the brake on the reel and reversing the engine.

HISTORY OF THE USE OF JARS FOR DRILLING, FISHING AND CLEANING OUT WELLS.

The round rein drilling jars were invented by William Morris, a blacksmith by trade, at the salt works of the Ruffner Brothers, at Malden, between Charleston and Burning Springs, on the Great Kanawha river, in West Virginia, in 1832. In that early day the jars were very crudely made, but the present style and make of jars is very difficult to manufacture, and requires the best steel and iron, as well as workmanship. The maker of jars is usually known as a "jar maker," and first class blacksmith throughout the oil region. The first swedged and crutched 6-inch stroke rectangle steel reins or links with knocking heads and cap ends made of iron for the pin and box joints on jars were made by Gibbs and Sterritt, oil well tool makers at Titusville, Pa., in 1865. The drilling jars are made with solid steel reins with four to six inch stroke and are called short stroked jars. The fishing jars are usually made of iron with steel lined reins or links, with a stroke from three to six feet and are called long stroked jars. The drilling jars are used on drilling wells only when the tools become fast, or in starting a fresh or newly dressed bit. All former writers who have had no practical experience with the use of drilling jars have led the public to believe that the jars open and close as the tools raise and drop to the bottom of the hole. Every practical oil man knows this is not true. In the first place they cannot drill as much hole with jars as they can without them. This accounts for all of the big holes drilled without jars. The jars are not used in West Virginia and southwestern Pennsylvania until the Big Dunkard sand is reached. This sand is below the big red rock and other caves, and is found at a depth of 1,000, to 1,500 feet below the surface. No jars are used in the big hole in the Lima, Ohio, and Indiana oil and gas fields; and no jars are used in the big hole in the northeastern Pennsylvania and New York oil fields. Jars are used very little and only in the small hole in Colorado and Kansas oil and gas fields. In the Texas oil fields jars are only used to clean out wells and fish with.

Jars are used on a great number of wells in California, from the top to the bottom of the hole, owing to the great number of crooked holes, due to the angle of the rocks or formations being on an angle of 90 degrees. Jars are only used in the lower or older rocks, where the grain of the lime and sand formations are finer and more gritty. This wears the bit out of gauge and in starting a fresh or new dressed bit, it usually sticks more or less before the hole is reamed out on the bottom. In case the bit is much worn out of gauge the proper thing to do is to put on a fresh bit, it usually sticks more or less before the hole is reamed out on the bottom. In case the bit is much worn out of gauge the proper thing to do is to put on a fresh dressed bit and after the joint is "set up" run the tools to the bottom of the hole very rapidly without checking the tools until the hitch string is at the hole and not try to start the bit with a tight hitch. This is the cause of breaking the points off the bit and often breaks the jars. Five or six feet of rope should be allowed for a loose hitch below the last hitch.

After hitching on, a little more steam should be given the engine than is required to drill with. This gives the engine a faster motion and as the jar picks the tools up and raises them from the bottom the engine is checked down by the added weight of the tools, and as the tools drop the bit reams out the hole. After the tools are raised and dropped 10 or 15 times the tools will drop and raise free and regularly without sticking. This is called a loose or Big Injun hitch and is the only time the jars open and close. Just as soon as the tool dresser is ready the bull rope should be put on and the cable and tools pulled up in the hole. The bull rope should be thrown off and the tools should be sprung down for a tight or drilling hitch. The screw can be run up to suit the driller and hitched on and drilling start. When drilling is done as it should be the jars are wide open and act like solid steel or iron. If the jars open and close while running this is a true sign that the driller is running too loosely and is not raising his stem off the bottom. This is called "boot jacking the jars." The jar or kick that is seen or felt on the cable or temper screw is caused by the tools striking bottom. When the tools just touch bottom a light jar is felt. When the tools strike heavily a very heavy jar is felt, and when a light springy jar is felt it is a sign that the tools are too loose. This is the rule that all drillers go by. It applies to all kinds of cable drilled wells with or without jars. On a great number of wells accidents occur, such as a bit unscrewing or a pin may break off the bit. The box on the stem may break off, the jars or the stem may break in twain or the casing may collapse and a hundred other things may happen to cause a fishing job. On all fishing jobs long stroke jars are used because drilling jars are made of solid steel reins and short stroke, while the fishing jars are iron and steel lined and with extra long reins. The reins are made long that they may be able to jar up without breaking the hold. Jarring down or in both ways breaks the hold. It is very difficult to jar only one way in a fishing job with drilling jars; for example, the pitman and temper screw ends of the walking beam from the lower to the upper center is from two to three feet. While the stroke of the drilling jar is only four to six inches long this would allow the jars to strike both ways, which would break the hold. Whereas the fishing jar has a stroke from three to six feet.

PUMPING OIL WELLS BY ELECTRICITY.

The second and largest electric oil well pumping plant in the world is located at Folsom, Robinson station, Wetzel county, W. Va. In June, 1902, while

the officials of the Standard Oil Company were on a tour of inspection of their properties in West Virginia Mr. H. H. Rogers, president of the National Transit Company and first vice president of the Standard Oil Company, conceived the idea of purchasing the large block of leases held by the firm of Carnahan, Smith and Robinson, known as the Robinson tract in Folsom district, W. Va. Messrs. Carnahan, Smith and Robinson had two wells producing and one well drilling on the large tract of leases when they were interviewed by an agent for the Standard Oil Company in August, 1902. The sale of the leases at $1,000,000 was agreed upon and they were turned over to the management of the South Penn Oil Company, one of the producing branches of the Standard Oil Company, and at once steps were taken to drill and have the property producing as fast as possible.

The South Penn Oil Company at that time were experimenting with electric power for pumping oil wells at the first electric power pumping plant built in the world, on one of their leases at Finney station, Washington county, Pa., which proved to be a success. This prompted Mr. H. H. Rogers to suggest electrical power for the Folsom district to the operating committee of the Standard Oil Company, which consisted of H. H. Rogers, president of the National Transit Company and first vice president of the Standard Oil Company; John D. Archbold, president of the South Penn Oil Company and chairman of the executive committee of the Standard Oil Company; Colonel John J. Carter, president of the Carter Oil Company, one of the producing branches of the Standard Oil Company; W. J. Young, vice president of the South Penn Oil Company; C. N. Payne, president of the Pennsylvania Natural Gas Company; G. T. Braden, general manager of the Hope Natural Gas Company, and John S. Kline of the National Transit works.

This committee was appointed to procure estimates on the probable cost of constructing a power plant with a capacity for pumping 200 deep sand wells. Electrical engineers, boiler and engine makers and manufacturers of electrical equipment had to be consulted in preparing the specifications and in the end it was discovered that to construct a plant with a capacity for pumping 200 wells the cost would reach about $200,000. It was at once decided to build the plant and the work was pushed forward with the greatest energy, as it was desired that the plant be completed and in operation in time for the annual inspection in 1903.

The building in which the plant is installed is constructed of brick, the engine room being 57x60 feet in dimensions. The boiler room is 50x55 feet and is separated from the engine room by a wall partition running the full length of the building, and the unoccupied floor space is covered with cement. The roof is of slate, supported by steel trusses.

The equipment of the engine room consists of two triple expansion, condensing 375 horse power vertical engines of the Williams type; directly connected to two 250 kilowatt general electric, three phase, revolving field generators, moving at 300 revolutions per minute and 600 volts. These machines are of the alternating current type and run at 25 cycles per second. which gives the best results for power work.

The generators are supplied with exciting current from a 30 kilowatt, direct connected engine driven set. The generator current is started by the engine driven exciter, after which it is supplied by a 30 kilowatt motor driven set. The main switchboard is of blue Vermont marble, and consists of six panels as follows: One main panel for each 250 kilowatt generator and three feeder panels, all equipped with the necessary instruments and oil break switches. The main panels are also supplied with overload time limit relays.

The current is generated at 600 volts for local feeder lines, which supply the current to motors at the wells, located within a radius of one mile from the power plant. For greater distances than this the current is raised to 6,000 volts for transmission to the sub stations, located two miles apart, and is transmitted in both directions from sub stations and supplied to motors at the wells in their respective localities. The transformers consist of three 100 kilowatt 600 volt primary, 6,000 and 13,000 volts secondary, step-up transformers of the oil cooled type and located in the main station. The equipment of the sub stations consist of one 150 kilowatt, 6,000 and 13,000 volts primary, and 600 volts secondary, step-down transformers of the three phase type.

The switchboard consists of high potential panel with automatic oil break switch and ammeter, in addition to local feeder panels with oil switch, of the non-automatic type and expulsion fuses. The transmission of the current from the main and sub stations to the motor at the well consists of a pole line of standard construction, with bare wire on all main lines. The branch lines running to the wells are insulated from the main line to the same. The transmission line is of No. 4 soft drawn copper wire and hung on seven inch double petticoat glass insulators. Each well is equipped with a specially designed 10 horse power motor, governed by an oil break controller, which allows for series and paralleling of the fields to change speed in addition to reversing the motion when it is so desired. The motors are circular in shape and about two feet in diameter, and are bolted firmly to the engine block. The motor is geared up to a 30-inch pulley, which is belted direct to the band wheel in the belt house and the speed controlled by the usual wire and pulley attachment, when it is desired to change from a low to a high speed, such as is required in pulling rods and tubing. For pumping the motor is run at slow speed, giving on an average about 20 revolutions on the pitman. The output of the motor at this speed is from seven to eight horse power, and is regarded as the most economical running of the motor for ordinary work. However, when the motor is thrown from low to high speed the output is increased to 52 horse power, this being the limit or breakdown point of the motor. The motors are constructed without collector rings or starting resistance and are put in motion by a specially constructed controller filled with transil oil, which prevents sparking and removes the danger of fire from that cause.

The boiler house contains the usual equipment and apparatus for generating steam, a battery of three boilers of 225 horse power each of the Geary water tube type, equipped with duplicate boiler feed pumps

and feed water heater. Natural gas is used for fuel, boilers being fitted up with Kline and Kirkwood burners. All three boilers feed into an underground flue draft for same, being supplied by a steel, self supporting stack, 125 feet in height and 54 inches in diameter.

The boiler equipment is designed with a view to the economical use of water, being supplied with a Worthington surface condenser and cooling tower, which is 40 feet high and 72 inches in diameter. The water is cooled by a 72-inch rotary fan driven by a 15 horse power motor. There is also installed a hot well and vacuum pump driven by a 15-horse power motor. By this means the water is converted into steam and the exhaust, or steam, reconverted into water over and over again, the only loss being caused by evaporation. For supplying the loss arising from that cause an 800 barrel reservoir has been constructed so that a shrinkage of water supply can be averted at all times.

It is expected by the adoption of electricity as a power for pumping and drilling wells the expense can be reduced to the minimum. As compared with steam power, it will have many advantages aside from a reduction in operating expenses.

The two items of greatest expense in equipping a pumping well are the boiler and engine. In the deep sand territory it requires one 25 horse power boiler and three engines to pump three wells. This alone represents an outlay of about $680 to each well. With the power supplied direct from the main plant these can be done away with and the motor substituted at a nominal cost not to exceed $400. Another heavy item of expense is the laying and boxing of steam lines. In the spring time when the frost leaves the ground there are numerous slides that carry away the lines and in crossing ravines the lines have to be supported by trestle work to prevent them from being carried away when the mountains streams become roaring torrents, as is frequently the case. Fuel and water are also expensive, and it is estimated that a saving of from 60 to 70 per cent can be made in these two items. During the dry season a scarcity of water not only causes a suspension of drilling wells, but many of the pumping wells have to be shut down. The only expense with the adoption of electricity will be the erection of poles and the stringing of the copper wire to the point where it is desired to utilize the power. The estimated cost of electricity, compared with steam as a motive power, is very much less and decreases proportionately as the number of motors installed is increased. Exclusive of equipment and installation, the probable cost of pumping a well, which includes all labor connected therewith, will not exceed five or six cents per hour. The wells in this district are not pumped continuously and the most of them not more than three out of each 24 hours. A series of say 125 wells can be pumped at one time, this method allowing the installation of a large number of motors and pumping the wells in sections of from 20 to 25; then the current is switched to another series and so on until the entire group of wells within a radius of as many miles as desired have been pumped. The distances, as has been demonstrated by the adoption of electricity as a motive power for purposes other than pumping oil wells, is limited only to the capacity of the equipment. While the plant at Folsom is equipped for pumping 200 wells, the construction is such that its capacity can be increased to 400 wells.

From an economical standpoint the new system promises to work a revolution in furnishing power and equipment for pumping and drilling wells.

DRILLING CABLES, ROPE AND ROPE MAKING, ANCIENT AND MODERN.

The word cordage is used in general for all sorts of ropes and cords, great and small, but its application is more particularly to rigging and fitting out vessels and drilling wells. The first ropes were probabily made of the fibers of the inner bark of some kinds of trees, or of vines or grasses, and of thongs made from the hides of animals.

There are sculptures among the relics of the ancient Egyptians illustrating the manner of making ropes more than 4,000 years ago, and their most ancient records contain representations of well made ropes capable of withstanding the enormous strain developed in transporting their colossal statues and huge blocks of stone.

The process of preparing the hemp is shown in the tomb of Beni Hassan, at Thebes. Ropes of the palm are found in the tombs, and it was probably almost as common as coir or cocoanut fibre in India. The sculpture represents the process of making ropes from the thongs of leather. The material is shown by the skin hanging up in the shop. The thongs were cut by turning the piece around while the workman cuts with a knife, the same means we now use. As the workman receded he twisted the rope by some kind of a swivel that evidently had a weight, used both for a handle to twist the rope and by its weight to prevent the rope untwisting. An assistant arranged the strands as the work progressed.

The most celebrated ropes known to history were the cables used in the construction of the bridges on which the army of Xerxes crossed the Hellespont (Herodotus vii, 36). There were two bridges and six cables assigned to each bridge. If we assume the cubit to be 22 inches, the cable must have measured about 28 inches in circumference. The ropes of the Tartars are made of camel's hair and horse hair. Herodotus (iv, 74) mentions the wild and uncultivated hemp of Scythia. Hesychius says the Thracian women made sheets of hemp. Moschion (about 200 B. C.) records the use of hempen ropes for rigging the ship Syracusia, built for Hiero II.

The earliest attempt to introduce machines for making rope was made by Cartwright, the famous inventor of the power loom, who in 1792 obtained a patent for a machine called by him a "cordelier." Cartwright's cordelier, as improved in 1805 by Captain Huddart, became the basis of modern laying and forming machines. Numerous modifications and improved combinations have been introduced, but the principle on which they worked is essentially the same.

The use of machinery for making rope in the Unit-

ed States began in the nineteenth century, prior to 1820. The wheel or "whirl" used for hand spinning, to manufacture rope, aided by other imperfect mechanical contrivances, in the old fashion rope walk, was the only means employed.

Some machines were imported from England for twisting hand spun yarn into strands. These were considered a great improvement and proved to be a step in the right direction.

The skill of the American inventor has made such radical changes in machinery for the spinning of the threads and the process of rope making from the raw material that cordage made in the United States is held in high esteem and is exported to nearly all the countries on the globe. American rope machinery is now extensively used in European countries.

There are still some varieties of cordage manufactured by hand labor, but before many years the old fashioned rope walk will be a curiosity hardly to be found. This old process of rope making is essentially as follows:

The fibres of the hemp are first hackled to straighten out the fibre and to remove all tow, broken hemp and foreign substance. The workman places a bundle of fibre around his body, attaching one end to a hook in the whirl, drawing out the threads from the bundle with one hand, compressing the strand with the other. Experience teaches him the amount of fibre to use for the size cord he is to make. He then walks slowly backward down the walk, making the yarn as he goes, the spinning being done by the whirl, which is operated by an attendant, the spinner being very attentive to supply the fibre equally.

Two spinners may occupy the same walk and the same whirl, uniting the ends of their yard when they reach the end of the walk, and thus make it continuous. They will begin again at the whirl, and so repeat the operation to the end, uniting them as before, when all is wound upon reels. When a sufficient number of yards are spun they are twisted into strands and the strands into ropes. Sometimes horse power is used for this purpose.

The methods now in use in the immense factories of today with the latest improved construction, driven by large steam engines, present a very striking contract with this primitive process.

The materials now employed in the manufacture of rope are various, embracing jute, cotton, hemp, sisal, manila, flax and other vegetable fibres.

The manila hemp is perhaps more extensively used for rope than any other material. Its strength and great pliancy make it more particularly adapted for vessels and for a great number of ordinary uses.

Sisal from Yucatan and jute from the East Indies are used for the cheaper grades of rope.

The fibre is cut down and divided into small strips. These, while still in their succulent condition, are drawn between a sharp knife edged instrument and a hard wooden block to which it is fixed. By repeated scraping in this way the soft cellular matter which surrounds the fibre is removed, and the fibre so cleaned has only to be hung up to dry in the open air, when, without further treatment, it is ready for use. Each stock yields on an average nearly one pound of fibre—round, silky looking and lustrous, easily separated, stiff and very tenacious, and also very light. These fibres have great strength in the direction of their length, but are weak transversely. The finest is then separated by the women, and packed into bales of about 270 pounds each. Two natives cutting down plants and separating fibre will prepare not more than 25 pounds a day. The fibre yielded by the outer layers of the leaf stocks is hard, fully developed and strong, but the produce of the inner stalk is increasingly thin and fine. From these the inhabitants weave tissues of great delicacy. The fibres are not spun, but used in their natural state, those of a proper size being selected. The single fibres are tied together at their ends and wound into a ball, then soaked in hot water and dried, when they are ready for weaving. Tissues woven from the Abaca fibre are almost transparent, somewhat rigid, light and cool to the touch. Muslins, veils, napkins, etc., are made from it. The material readily takes dyes of all colors.

Approximate Strength and Length of Rope.

Size in Circumference	Size in Diameter	Strength of Manila Rope pounds	Length of Manila Pope per pound
½	3-16	540	60 feet inches
¾	1-4	780	40 feet inches
1	5-16	1000	30 feet inches
1⅛	3-8	1280	23 feet inches
1¼	7-16	1562	16 feet 8 inches
1½	1-2	2250	12 feet 9 inches
1¾	9-16	3062	9 feet 8 inches
2	5-8	4000	7 feet 6 inches
2¼	3-4	5000	6 feet inches
2½	13-16	6250	5 feet inches
2¾	7-8	7500	4 feet 3 inches
3	1	9000	3 feet 8 inches
3¼	1 1-16	10500	3 feet 2 inches
3½	1 1-8	12250	2 feet 10 inches
3¾	1 3-16	14000	2 feet 5 inches
4	1 1-4	16000	2 feet 3 inches
4¼	1 3-8	18062	2 feet inches
4½	1 7-16	20250	1 foot 8 inches
4¾	1 1-2	22500	1 foot 7 inches
5	1 5-8	25000	1 foot 5 inches
5½	1 3-4	30250	1 foot 3 inches
6	1 7-8	36000	11½ inches
6¼	2 -	39000	10 2-3 inches
6½	2 1-8	42250	9¾ inches
7	2 1-4	49000	8½ inches
7½	2 1-2	56250	7½ inches
8	2 9-16	64000	5½ inches
8½	2 3-4	72250	5 inches
9	2 7-8	81000	4½ inches
9½	3 -	90250	4 inches
10	3 3-16	100000	3½ inches

PREPARING THE FIBRE.

Bales of manila as originally brought from the Philippine islands weigh about 270 pounds each. These are taken into the opening room where the bamboo bands are cut and the matting removed; then the manila is taken up; each hank (as twisted together) is hung up, untwisted, shaken out and straightened as much as possible. It is then placed upon carts of suitable length and width for convenience in hand-



MANILA PLANT

(Manila Island Fiber Plant) The Fiber is Used for Making Oil Well Drilling Cables

ling, when it is taken to the scutching room, the first mechanical operation. Here will be found machines with large cylinders having many long, sharp steel teeth. The manila is taken up and passed over these cylinders, to remove all the tow, broken ends, dirt and all other foreign matter which may adhere to it. It is then placed upon another cart and ready for the preparation room.

As it reaches this room the first machine to further treat it is the breaker. Here we find a very large, heavy machine, having two endless chains, each full of long, sharp steel pins. The first chain, running slow, passes the fibre to the second and faster running chain, which combs out and straightens the fibre, drawing it into one long, continuous sliver. The fibres, while passing through this machine are lightly sprayed with oil to soften and lubricate them. These slivers are then taken to a machine called the spreader, which is very similar to the breaker, but smaller, the mechanism is much finer and runs more rapidly. Several slivers are passed through this machine together, producing a much smaller sliver, combed out more evenly.

This drawing continues through a series of these machines, each in succession being lighter, running with endless chains, with finer sharp steel pins.

This drawing is repeated a number of times, in order to make the sliver more even, evenness being necessary to produce a nice, fine, even yarn.

This process is finally completed on a very fine drawing frame called a finisher. From this machine the material emerges complete ready for spinning. From the preparation room the fibre, in large cans, is carried to the spinning room, where the sliver is converted into yarn. In this room are long rows of spinning frames, each operating two spindles, run at a very high rate of speed. As the fibre is being spun it is wound upon bobbins holding about 10 pounds each. This is the most interesting part of the process as well as the most particular, as each attendant has to see that the sliver is regularly supplied, and that the bobbins, when full, are replaced again with empty ones, and each machine as well as the floor around it kept clean. After being spun, the yarn which is on the bobbins is put on carts and taken to the carriers, where it is delivered to the several departments for which it is intended—rope yarn going to the rope room and binder twine to the balling room.

ROPE ROOM.

Here we find different machines. Some to make twisted hay rope and hide rope, and others to lay up twines for tieing up packages, and paper twine. Machines with formers and layers combined, which twist the yarns into strands and strands into ropes. Other layers and formers are separate. The formers lay the yarns into strands on large iron bobbins and when full these bobbins are transferred to the rope layer, where the strands are laid into rope. It is then reeled into a nice compact coil and covered with clean new burlap. After being properly marked and weighed, it is send to the carrier, which delivers it to the store house.

DRILLING CABLES.

Cables for drilling oil and gas wells are made in lengths varying from 850 feet to 3,500 feet, and in size from 1¼ to 2½ inches in diameter. In manufacturing them they use three ropes of three strands each, twisted right handed. When made into a cable they are laid left handed. These are made upon upright machines, constructed especially for this work, being large and heavy, because of the great power required to manufacture one of these large cables.

MATERIAL REQUIRED TO BUILD A COMPLETE RIG.

1000 feet	20 x	2"	Flooring	
30	2' x	12"		20 feet
20	2' x	10"		20 feet
4	2' x	8"		20 feet
10	2' x	6"		20 feet
12	2' x	6"		18 feet
40	2' x	10"		16 feet
44	2' x	8"		16 feet
30	2' x	4"		16 feet
100	1' x	6"		16 feet
30	1' x	12"		16 feet
2000	1' x	12"		14 feet
2500	1' x	12"		16 feet
2	5' x	14"	Oak	16 feet
3	2' x	12"	Oak	16 feet
1	2' x	14"	Oak	16 feet
2	6' x	8"	Oak	17 feet
3	6' x	8"	Oak	14 feet
1	6' x	8"	Oak	12 feet
1 Pitman	5' x	8"	5' x 14"	12 feet

For a double rig with hard wood top to drill 2,500 to 4,000 feet, 80-foot derrick.

3	Engine house mud sills, flattened, 14 inches	16 feet
2	Engine house pony sills, 14 x 14	12 feet
1	Engine block, 24 x 24	8 feet
2	Butting poles, 8 x 8	28 feet
3	Mud sills, flattened, 16 inches	21 feet
1	Mud sill, 16 inches	18 feet
1	Nose sill, 16 inches	14 feet
2	Dump Sills, 12 inches—square	14 feet
1	Main sill, 16 x 16, 24 x 24	32 feet
1	Sub sill, 18 x 18	18 feet
1	Sand sill and tail post, 12 x 12	16 feet
1	Samson post 16 x 16, 20 x 20	16 feet
1	Jack post, 18 x 18	18 feet
1	Bull wheel shaft, 8 sq. 20 inches diameter	16 feet
2	Bull wheel posts, 14 x 14	11 feet
1	Swing lever, 10 x 14, 10 x 10	10 feet
1	Beam, 15 inches thick, 26 inches deep	26 feet
2	Side sills flattened, 12 x 12 face	21 feet
2	Working sills flattened, 12 x 12 face	21 feet
4	Derrick sills, 10 x 8	21 feet
1	16-foot log for props, 16 inches diameter.	
1	16-foot log, 16 inches diameter.	

NAMES OF PARTS OF RIGS.

1 Nose sill or Short Sill under end of Main Sill.
1—1 Mud Sill No. 1.
1—2 Mud Sill No. 2.
1—3 Mud Sill No. 3.
1—4 Mud Sill No. 4.
2 Main Mud Sill.
3 Sub Sill or Counter Sill.
4 Sand Reel Tail Sill.
5 Knuckle Post.
6 Tail Post.
6—1 Tail Post Braces.
6—2 Front Jack Post.
8 Rear Jack Post.
8—1 Jack Post Brace.
8—2 Jack Post Brace.

9 Samson Post.
9—1 Samson Post Brace.
9—2 Samson Post Brace.
9—3 Samson Post Brace.
9—4 Samson Post Brace.
10 Walking Beam.
10—1 Walking Beam Cap or Adjuster Board.
11 Sand Reel.
11—1 Sand Reel Lever.
11—2 Sand Reel Reach.
11—3 Sand Reel Handle.
12 Band Wheel.
13 Pitman.
14 Derrick Foundation Posts.
15 Derrick Mud Sill.
15—1 Derrick Mud Sill.
16 Derrick Floor.
16—1 Derrick Floor.
16—2 Derrick Floor.
16—3 Derrick Floor.
16—4 Derrick Floor.
16—5 Derrick Floor.
17 Derrick Floor, 20 pieces, 2' x 12' x 20".
18 Bull Wheels.
18—1 Bull Wheel Post.
18—2 Bull Wheel Post.
18—3 Bull Wheel Post Brace.
19 Head Ache Post.
20 Derrick Corner.
21 Derrick Girt.
22 Derrick Brace.
23 Derrick Ladder.
24 Crown Block.
25 Sand Pump Pulley Block.
1 Flanges.
2 Shaft Crank and Wrist Pin.
3 Saddle and Side Irons.
4 Stirrup.
5 Drilling Hook.
6 Brake Lever.
7 Brake Band.
8 Brake Staple.
9 Crown Pulley.
10 Sand Pump Pulley.
11 Engine.
9 Engine Block.
9—1 Engine Pony Sill.
9—2 Engine Pony Sill.
13 Engine Mud Sill.
13—1 Engine Mud Sill.
14 Engine Block, Brace (or Bumper).
15 Boiler.
16 Tank.
17 Sand Line.
18 Cable.
19 Bull Rope.
20 Telegraph Cord.
20—1 Telegraph Wheel.
21 Reverase Rod.
22 Rope Socket.
23 Sinker Bar.
24 Jars.
25 Augur Stem.
26 Drilling Bit.
27 Temper Screw.
27—1 Bailer.
27—2 Sand Pump.

SPECIFICATION OF MATERIAL REQUIRED TO BUILD A COMPLETE RIG, DERRICK 72 FEET HIGH.

Hard Wood.	Size Inches	Length Feet
1 Mud Sill	14x16	16
1 Mud Sill	14x16	16
1 Mud Sill	14x16	20
1 Mud Sill	14x16	20
2 Engine Mud Sills	14x14	14
2 Engine Pony Sills	12x12	8
1 Sand Reel Tail Sill	12x12	12
1 Piece for Tail Post	12x12	5
1 Piece for Jack Post and Knuckle Post	16x16	16
1 Piece for Jack Post Caps	4x10	3
2 Pieces for Bull Wheel Posts	10x10	11
3 Pieces for Keys	3x5	16
1 Pitman, tapered	4x4-4x9	12
1 Piece for Crown Block	2x12	12
1 Piece for Sand Pulley Block	2x12	5
1 Sand Reel Lever	6x8	8
1 Piece for Adjuster Board	2x12	5
1 Piece for Sand Reel Handle	2x6	8
Hemlock or Pine.		
1 Nose Sill	16x18	6
1 Main Sill	18x18	33
1 Sub Sill	16x18	16
2 Derrick Mud Sills	10x10	21
3 Derrick Floor Sills	8x10	20
1 Walking Beam	12x26	26
1 Samson Post	16x16	13
2 Samson Post Braces	6x8	14
1 Samson Post Brace	6x8	16
1 Samson Post Brace	6x8	12
1 Engine Block	20x20	8
1 Headache Post	7x7	14
1 Bull Wheel Post Brace	6x8	14
1 Bumper from Engine Block to Mud Sill	6x6	33
20 Pieces for Derrick Floor	2x12	20
2 Jack Post Braces	6x8	16
6 Foundation Posts	16x18	4
Derrick Legs.		
16 Pieces	2x8	16
14 Pieces	2x10	16
2 Pieces	2x8	20
4 Pieces	2x10	18
4 Pieces (Doublers)	2x10	18
Bull Wheel Girt.		
1 Piece	2x12	18½
1 Piece for Reach	2x6	18
2 Pieces for Reach	1x6	14
2 Pieces for Beam Frame	2x6	10
1 Piece for Beam Frame	1x12	6
2 Pieces for Beam Braces	2x6	14
3 Pieces for Derrick Roof	2x8	16
2 Pieces for Forge Roof	2x10	16
8 Pieces for Sills for Belt and Engine Houses	2x6	16
2 Pieces for Sills for Belt and Engine Houses	2x6	12
12 Pieces for Plates for Belt and Engine Houses	2x4	16
4 Pieces for Plates for Belt and Engine Houses	2x4	12
8 Pieces for Ladder	2x4	16
3,000 feet boards	1x12	16

DERRICK GIRTS.

Derrick Girts	Size Inches	Length Feet
4 Pieces	1½ x 10	16
4 Pieces	2 x 12	18
4 Pieces	1½ x 10	16
4 Pieces	1½ x 10	12
4 Pieces	1½ x 10	14
4 Pieces	1½ x 10	10
4 Pieces	1½ x 10	8
4 Pieces	1½ x 10	6

DERRICK BRACES.

6 Pieces	2 x 6	18
8 Pieces	2 x 6	18
8 Pieces	1½ x 6	16
8 Pieces	1½ x 6	14
8 Pieces	1½ x 6	12
8 Pieces	1½ x 6	10
8 Pieces	1½ x 6	9

DERRICK CORNICE.

1 Piece	1½ x 14	16
1 Piece	1½ x 10	16
1 Piece	1½ x 6	18
1 Piece	1¼ x 12	16
2 Pieces (Top)	1½ x 12	16

NAILS.

125 lbs. 10 d. 75 lbs. 20d. 100 lbs. 30 d.

BOLTS WITH WASHERS.

20 ¾-in. Machine, assorted lengths.
8 7-8 x 16-inch double end.

FOR WHEELS.

1 Set of Bull Wheel Cants.
1 Set of Bull Wheel Arms.
1 Set of Bull Wheel Pins.
1 Bull Wheel Shaft.
1 Set Band Wheel and Tug Pulley Cants.
1 Sand Pump Reel.

IRONS FOR RIG.

1 Derrick (or Crown) Pulley.
1 Sand Pump Line Pulley.
1 Stirrup.
1 Saddle and Side Irons with Bolts.
1 Shaft, Crank, Wrist Pin and Collar.
1 Pair Flanges with Bolts.
1 Back Brake for Sand Reel.
1 Brake Band.
1 Brake Lever.
1 Brake Staple.
1 Pair Bull Wheel Gudgeons.

THE SIZE, MEASURES AND WEIGHTS OF TOOLS USED ON ALL OIL AND GAS WELLS AND THE PRESSURE OF OIL AND WATER.

The specific gravity of oil varies from .865 to .777. I will use an average of .800.

Size pipe.	Oil. Lb. per ft.	Water Lb. per ft
2 inch	.9152	1.144
4 inch	4.1728	5.216
5 inch	6.428	8.16
6 inch	9.344	11.68
6½ inch	11.008	13.76
8 inch	16.704	20.88
10 inch	25.112	32.64
13 inch	44.096	55.12

PRESSURE OF WATER.

The pressure of water in pounds per square inch for every foot in height to 260 feet; and then by intervals to 3,000 feet head. By this table, from the pounds pressure per square inch, the feet head is readily obtained, and vice versa.

Feet, Head.	Pressure, per sq. inch.	Feet, Head.	Pressure, per sq. inch.	Feet, Head.	Pressure, per sq. inch.	Feet, Head.	Pressure, per sq. inch.	Feet, Head.	Pressure, per sq. inch.	Feet, Head.	Pressure, per sq. inch.
1	0.43	54	23.39	107	46.34	160	69.31	213	92.20	285	123.45
2	0.86	55	23.82	108	46.78	161	69.74	214	92.69	290	125.62
3	1.30	56	24.26	109	47.21	162	70.17	215	93.13	295	127.78
4	1.73	57	24.69	110	47.64	163	70.61	216	93.56	300	129.95
5	2.16	58	25.12	111	48.08	164	71.04	217	93.99	305	132.12
6	2.59	59	25.55	112	48.51	165	71.47	218	94.43	310	134.28
7	3.03	60	25.99	113	48.94	166	71.91	219	94.86	315	136.46
8	3.46	61	26.42	114	49.38	167	72.34	220	95.30	320	138.62
9	3.89	62	26.85	115	49.81	168	72.77	221	95.73	325	140.79
10	4.33	63	27.29	116	50.24	168	73.20	222	96.16	330	142.95
11	4.76	64	27.72	117	50.68	170	73.64	223	96.60	335	145.12
12	5.20	65	28.15	118	51.11	171	74.07	224	97.03	340	147.28
13	5.63	66	28.58	119	51.54	172	74.50	225	97.46	345	149.45
14	6.06	67	29.02	120	51.98	173	74.94	226	97.90	350	151.61
15	6.49	68	29.45	121	52.41	174	75.37	227	98.33	355	153.78
16	6.93	69	29.88	122	52.84	175	75.80	228	98.76	360	155.94
17	7.36	70	30.32	123	53.28	176	76.23	229	99.20	365	158.10
18	7.79	71	30.75	124	53.71	177	76.67	230	99.63	370	160.27
19	8.22	72	31.18	125	54.15	178	77.10	231	100.00	375	162.45
20	8.66	73	31.62	126	54.58	179	77.53	232	100.49	380	164.61
21	9.09	74	32.05	127	55.01	180	77.97	233	100.93	385	166.78
22	9.53	75	32.48	128	55.44	181	78.40	234	101.36	390	168.94
23	9.96	76	32.92	129	55.88	182	78.84	235	101.70	395	171.11
24	10.39	77	33.35	130	56.31	183	79.27	236	102.23	400	173.27
25	10.82	78	33.78	131	56.74	184	79.70	237	102.66	425	184.10
26	11.26	79	34.21	132	57.18	185	80.14	238	103.09	450	195.00
27	11.69	80	34.65	133	57.61	186	80.57	239	103.53	475	205.77
28	12.12	81	35.08	134	58.04	187	81.00	240	103.96	500	216.58
29	12.55	82	35.52	135	58.48	188	81.43	241	104.39	525	227.42
30	12.99	83	35.95	136	58.91	189	81.87	242	104.83	550	238.25
31	13.42	84	36.39	137	59.34	190	82.30	243	105.26	575	249.09
32	13.86	85	36.82	138	59.77	191	82.73	244	105.69	600	259.90
33	14.29	86	37.25	139	60.21	192	83.17	245	106.13	625	270.73
34	14.72	87	37.68	140	60.64	193	83.60	246	106.56	650	281.56
35	15.16	88	38.12	141	61.07	194	84.03	247	106.99	675	292.40
36	15.59	89	38.55	142	61.51	195	84.47	248	107.43	700	303.22
37	16.02	90	38.98	143	61.94	196	84.90	249	107.86	725	314.05
38	16.45	91	39.42	144	62.37	197	85.33	250	108.29	750	324.88
39	16.89	92	39.85	145	62.81	798	85.76	251	108.73	775	335.72
40	17.32	93	40.28	146	63.24	199	86.20	252	109.16	800	346.54
41	17.75	94	40.72	147	63.67	200	86.63	253	109.59	825	357.37
42	18.19	95	41.15	148	64.10	201	87.07	254	110.03	850	368.20
43	18.62	96	47.58	149	64.54	202	87.50	255	110.46	875	379.03
44	19.05	97	42.01	150	64.97	203	87.93	256	110.89	900	389.86
45	19.49	98	42.45	151	65.40	204	88.36	257	111.32	925	400.70
46	19.92	99	42.88	152	65.84	205	88.80	258	111.76	950	411.54
47	20.35	100	43.31	153	66.27	206	89.21	259	112.19	975	422.35
48	20.79	101	43.75	154	66.70	207	89.66	260	112.62	1000	433.18
49	21.22	102	44.18	155	67.14	208	90.10	261	113.06	1500	649.70
50	21.65	103	44.61	156	67.57	209	90.53	262	113.49	2000	866.39
51	22.09	104	45.05	157	68.00	210	90.96	270	116.96	3000	1299.50
52	22.52	105	45.48	158	68.43	211	91.39	275	119.12		
53	22.95	106	45.91	159	68.87	212	91.83	280	121.29		

NUMBER OF GALLONS DIFFERENT SIZES OF PIPE HOLD.

Size Pipe.	Gals per ft.	Gals per 100 ft.	Bbls. per 2000 ft.
2 inch	.143	14.3	6.81
4 inch	.652	65.2	31.05
5 inch	1.02	102.	48.57
6 inch	1.46	146.	69.524
6½ inch	1.72	172.	81.9
8 inch	2.61	261.	124.29
10 inch	4.08	408.	194.29
13 inch	6.89	689.	328.01

RELATIVE EQUATIONS OF DIFFERENT SIZE PIPE.

Size.	Bbls. per hour.
2 inch	6
3 inch	16½
4 inch	34
5 inch	60
6 inch	94
8 inch	270

SIZE OF PACKERS AND CASING FOR SHUTTING OFF WATER IN WELLS.

Size Casing.	Size Hole.
3½ inch	4⅞
4¼ inch	5⅝
4½ inch	6¼
5⅝ inch	7⅝
5⅝ inch	8
6¼ inch	8
6⅝ inch	8¼

LAP WELDED CASING.

Diameter			Thickness		Circumference		Transverse Areas			Nom. Wt.	Threads
Size	External	Internal	Inches	B.W.G.	External	Internal	External	Internal	Metal	per ft lb.	per In.
2	2.25	2.06	.095	13	7.069	6.4717	3.976	3.33	.643	2.22	14
2¼	2.50	2.282	.109	12	7.854	7.1691	4.909	4.090	.819	2.82	14
2½	2.75	2.532	.109	12	8.639	7.9545	5.939	5.035	.904	3.13	14
2¾	3.	2.782	.109	12	9.425	8.7399	7.069	6.078	.991	3.45	14
3	3.25	3.01	.120	11	10.210	9.4562	8.296	7.116	1.180	4.10	14
3¼	3.50	3.26	.120	11	10.996	10.2416	9.621	8.347	1.274	4.45	14
3½	3.75	3.51	.120	11	11.781	11.0270	11.045	9.676	1.369	4.78	14
3¾	4.00	3.732	.134	10	12.566	11.7244	12.566	10.940	1.626	5.56	14
4	4.25	3.982	.134	10	13.352	12.5098	14.186	12.454	1.732	6.00	14
4¼	4.50	4.218	.141	.....	14.137	13.2513	15.904	13.973	1.931	6.36	14
4¼	4.50	4.094	.203	6	14.137	12.8617	15.904	13.163	2.741	9.38	14
4½	4.75	4.468	.141	.....	14.923	14.0367	17.728	15.676	2.052	6.73	14
4½	4.75	4.344	.203	6	14.923	13.6471	17.728	14.820	2.908	9.39	14
4¾	5.	4.704	.148	9	15.708	14.7781	19.635	17.380	2.255	7.80	14
5	5.25	4.954	.148	9	16.493	15.5634	21.648	19.275	2.373	8.20	14
5	5.25	4.867	.191	.....	16.493	15.2902	21.648	18.604	3.044	9.86	14
5	5.25	4.753	.248	3½	16.493	14.9320	21.648	17.743	3.905	12.80	11½
5	5.25	4.65	.300	1	16.493	14.6084	21.648	16.982	4.666	15.88	11½
5 3-16	5.50	5.187	.156	.....	17.279	16.2955	23.758	21.131	2.627	8.62	14
5 3-16	5.50	5.042	.229	4½	17.279	15.8399	23.758	19.965	3.793	12.49	11½
5⅝	6.	5.688	.156	.....	18.850	17.8694	28.274	25.407	2.867	10.46	14
5⅝	6.	5.594	.203	6	18.850	17.5741	28.274	24.575	3.699	12.04	11½
5⅝	6.	5.560	.220	5	18.850	17.4673	28.274	24.279	3.995	14.20	11½
5⅝	6.	5.457	.271	.....	18.850	17.1437	28.274	23.388	4.886	16.70	11½
6¼	6.625	6.280	.172	.....	20.813	19.7292	34.472	30.975	3.497	11.58	14
6¼	6.625	6.219	.203	6	20.813	19.5376	34.472	30.379	4.093	13.32	14 —11½
6¼	6.625	6.149	.238	.....	20.813	19.3177	34.472	29.696	4.776	17.02	11½
6⅝	7.	6.640	.180	7	21.991	20.8602	38.485	34.628	3.857	12.34	14
6⅝	7.	6.503	.248	.....	21.991	20.4298	38.485	33.214	5.271	17.51	11½—10
7¼	7.625	7.265	.180	7	23.955	22.8237	45.664	41.454	4.210	13.55	14
7⅝	8.	7.617	.191	.....	25.133	23.9295	50.265	45.569	4.696	15.41	11½
7⅝	8.	7.482	.259	.....	25.133	23.5054	50.265	43.968	6.297	20.17	11½
8¼	8.625	8.265	.180	7	27.096	25.9653	58.426	53.651	4.775	16.07	11½
8¼	8.625	8.167	.229	4½	27.096	25.6574	58.426	52.386	6.040	20.10	11½
8¼	8.625	8.082	.271	.....	27.096	25.3904	58.426	51.301	7.125	24.38	11½— 8
8⅝	9.	8.640	.180	7	28.274	27.1434	63.617	58.630	4.987	17.60	11½
9⅝	10.	9.577	.211	.....	31.416	30.0871	78.540	72.036	6.504	21.90	11½
10⅝	11.	10.594	.203	6	34.558	33.2821	95.033	88.147	6.886	26.72	11½
11⅝	12.	11.594	.203	6	37.699	36.4237	113.10	105.574	7.526	30.35	11½
12½	13.	12.457	.271	.....	40.841	39.1349	132.73	121.878	10.852	33.78	11½
13½	14.	13.432	.284	.....	43.982	42.1980	153.94	141.701	12.24	42.02	11½
14½	15.	14.416	.292	.....	47.124	45.2893	176.71	163.223	13.49	47.66	11½
15½	16.	15.416	.292	.....	50.265	48.4309	201.06	186.650	14.41	51.47	11½

STANDARD DIMENSIONS OF COUPLINGS FOR REGULAR CASING.

Size of Casing, Nominal Inside Diameter, Inches	Inside Diameter of Coupling, Inches	Outside Diameter of Coupling, Inches	Length of Coupling, Inches	Threads, Per Inch of Screw	Average Weight of Coupling, in Pounds
1¾	1 7/8	2 5-16	2⅜	14	.90
2	2 7-64	2 23-32	2⅝	14	1.31
2¼	2 11-32	2 29-32	2⅝	14	1.50
2½	2 19-32	3 5-32	2⅝	14	1.62
2¾	2 27-32	3 15-32	2⅝	14	1.75
3	3 3-32	3 ¾	3⅛	14	2.62
3¼	3 11-32	4	3⅛	14	2.87
3½	3 19-32	4 ¼	3⅛	14	3.06
3¾	3 27-32	4 ½	3⅛	14	2.25
4	4 1-16	4 23-32	3⅝	14	3.62
4	4 1-16	4 23-32	3⅝	14	3.93
4½	4 19-32	5 7-32	3⅝	14	4.06
4¾	4 13-16	5 15-32	3⅝	14	4.93
5	5 5-64	5 13-16	4⅛	14 & 11½	5.68
5 3-16	5 5-16	6 1-32	4⅛	11 & 11½	4.93
5⅝	5 55-64	6 ⅝	4⅛	14 & 11½	6.73
6¼	6 13-32	7 5-32	4⅛	14 & 11½	7.93
6⅝	6 51-64	7 ⅝	4⅝	14 & 11½	9.68
7¼	7 15-32	8 ¼	4⅝	14 & 11½	9.93
7⅝	7 25-32	8 23-32	5⅝	11½	14.00
8¼	8 13-32	9 ⅜	5⅛	11½	15.37
8⅝	8 25-32	9 ¾	5⅛	11½	15.93
9⅝	9 ¾	10 25-32	6⅛	11½	24.60
10¼	10 ½	11 ½	6⅛	11½	26.00
10⅝	10 25-32	11 ⅞	6⅛	11½	27.83
11⅝	11 25-32	12 ⅞	6⅛	11½	29.75
12½	12 25-32	14	6⅛	11½	35.00
13½	13 25-32	15	6⅛	11½	42.50
14½	14 ¾	16 ⅛	6⅛	11½	50.00
15½	15 ¾	17 ⅛	6⅛	11½	52.50

SIZE AND WEIGHT OF CASING PER FOOT.

Size.	Weight, Lbs.
13 inch, heavy	42
10 inch, heavy	35
10 inch, light	32
8 inch, heavy	28
8⅛ inch, medium	24
8⅛ inch, light	16
6½ inch, heavy	17
6⅝ inch, light	13
6⅛ inch, heavy	16
6¼ inch, light	12
5½ inch, heavy	14
5⅝ inch, light	10
5 inch, heavy	13
5 3-16 in. light	10
4 inch	9

A JOINT OF CASING, 20 FEET LONG.

Size.	Weight, Lbs.
13 inch	850
10 inch	700
8 inch	560
6⅝ inch	340
6¼ inch	240
5⅝ inch	290
5 3-16 in.	246
4 inch	200

TWO-INCH TUBING.

Quality.	Lbs. per Foot.
Standard	4
Special	4½
Light	3½
Steam pipe	3

STANDARD DIMENSIONS OF WROUGHT IRON PIPE FOR STEAM, GAS AND WATER.

Nominal Inside Diameter.	Actual Inside Diameter.	Actual Outside Diameter.	Thickness.	Length of Pipe Containing One Cubic Foot.	Weight Per Foot of Length.	Number of Threads Per Inch.
Ins	Ins.	Ins.	Ins.	Feet.	Lbs.	
⅛	.270	.405	.068	2500.	.243	27
¼	.364	.54	.086	1385.	.422	18
⅜	.494	.675	.091	751.5	.561	14
½	.623	.84	.109	472.4	.845	14
¾	.824	1.05	.113	270.	1.126	11½
1	1.048	1.315	.134	166.9	1.670	11½
1¼	1.380	1.66	.140	96.25	2.258	11½
1½	1.611	1.9	.145	70.65	2.694	11½
2	2.067	2.375	.154	42.36	3.767	11½
2½	2.468	2.875	.204	30.11	5.773	8
3	3.067	3.5	.217	19.49	7.547	8
3½	3.568	4.	.226	14.56	9.055	8
4	4.026	4.5	.237	11.31	10.728	8
4½	4.508	5.	.247	9.03	12.492	8
5	5.045	5.563	.259	7.20	14.564	8
6	6.065	6.625	.280	4.98	18.767	8
7	7.023	7.625	.301	3.72	23.410	8
8	7.982	8.625	.322	2.88	28.348	8
9	9.001	9.688	.344	2.26	34.677	8
10	10.019	10.75	.366	1.80	40.641	8

CASING ELEVATORS.

Size.	Weght, Lbs.
10 inch heavy elevators, per set	560
8 inch heavy elevators, per set	425
6⅝ inch heavy elevators, per set	350
3 3-16 in. heavy elevators, per set	300
4 inch heavy elevators, per set	200
2 inch tubing elevators, per set	150
Casing tongs	76
Tubing tongs	40

WEIGHTS PER FOOT OF DRILLING STEMS.

Diameter.	Lbs.	Diameter.	Lbs.
2 inches	23.81	4¾ inches	59.67
3¼ inches	27.94	5 inches	66.13
3½ inches	32.41	5¼ inches	72.61
3¾ inches	37.30	5½ inches	80.02
4 inches	42.33	5¾ inches	87.46
4¼ inches	47.78	6 inches	95.23
4½ inches	53.57		

WEIGHT OF DRILLING STEMS FORTY FEET LONG.

Diameter.	Lbs.	Diameter.	Lbs.
3 inches	952.40	4¾ inches	2387.60
3¼ inches	1117.60	5 inches	2645.20
3½ inches	1296.50	5¼ inches	2916.40
3¾ inches	1492.00	5½ inches	3200.80
4 inches	1693.40	5¾ inches	3498.40
4¼ inches	1911.20	6 inches	3809.20
4½ inches	2142.80		

TOOL JOINTS.

Size.	Weight.
4½ inch box and pin	310
4¼ inch box and pin	300
4 inch box and pin	275
3¾ inch box and pin	190
3¼ inch box and pin	120
3 inch box and pin	100
2⅝ inch box and pin	90

PATENT TAPER JOINT.

Seven Flat Threads or Eight Sharp Threads to the Inch.

Size of Hole	Size of Joint	Size of Wrench Square	Diameter of Pin Collar	Diameter of Box Collar
3½ or 4 -inch.	1⅝x2 -inch.	2¼-inch.	2⅞-inch.	3 -inch.
4¼ or 4½-inch.	1⅝x2½-inch.	2½-inch.	3½-inch.	3⅝-inch.
5 -inch.	2 x3 -inch.	3¼-inch.	4¼-inch.	4⅜-inch.
5⅛ -inch.	2¼x3¼-inch.	3½-inch.	4½-inch.	4¾-inch.
6¼ -inch.	2½x3½-inch.	4 -inch.	5 -inch.	5⅜-inch.
6¼ or 6⅝-inch.	2¾x3¾-inch.	4 -inch.	5¼-inch.	5⅜-inch.
⅝ or 8¼-inch.	3 x4 -inch.	4½-inch.	6 -inch.	6¼-inch.
8 or larger.	3½x4½-inch.	5 -inch.	6½-inch.	6⅜-inch.
8 or larger.	3½x4½-inch.	5 -inch.	6½-inch.	6⅝-inch.

WEIGHT OF DRILLING BITS WHEN NEW.

Size.	Iron and Steel.	Weight, Lbs.
16 -inch	per set, 800 lbs. steel	2250
13 -inch	per set, 600 lbs. steel	1600
10 -inch	per set, 500 lbs. steel	1400
8¼ -inch	per set, 400 lbs. steel	1000
5⅜ -inch	per set, 300 lbs. steel	800
5 3-16-in.	per set, 200 lbs. steel	600
4 -inch	per set, 150 lbs. steel	500

DRILLING CABLES, 3,000 FEET LONG.

1⅞-inch	3750 lbs.
2 -inch	3990 lbs.
2⅛-inch	4860 lbs.
2¼-inch	5670 lbs.
2½-inch	6750 lbs.

WIRE CASING LINES, 500 FEET LONG.

⅞-inch	660 lbs.
1 -inch	790 lbs.
1⅛-inch	1000 lbs.
1¼-inch	1250 lbs.
1½-inch	1500 lbs.

WIRE SAND LINES, 3,000 FEET LONG.

⅜-inch	630	⅝-inch	1610
½-inch	930	¾-inch	2760
9-16-inch	1230		

WEIGHT OF IRON BAILERS, 20 FEET LONG.

10 inch	590	5 inch	210
8 inch	390	4½ inch	170
7 inch	320	4 inch	150
6 inch	300	3 inch	100

WEIGHT OF STEAM BOILERS, COMPLETE.

Size.	Weight.
20 horse power	5975
23 horse power	6530
25 horse power	6900
30 horse power	8200
35 horse power	9000
40 horse power	9900

One horse power will raise 16½ tons per minute a height of 12 inches working eight hours a day, or 12 times a man's work. Or will raise 33,000 pounds one foot in one minute.

WEIGHT OF STEAM ENGINES, COMPLETE.

Size.	Weight, Lbs.
20 horse power	3000
23 horse power	3700
30 horse power	4100
35 horse power	4200
40 horse power	4300
45 horse power	4400
50 horse power	4600

WEIGHT OF TOOLS USED ON DRILLING WELLS.

Bellows	150 lbs.
Anvil	200 lbs.
Crane and pulleys	375 lbs.
Crane wrench	100 lbs.
Temper screw	250 lbs.
Forgie jack	250 lbs.
Subs, large	175 lbs.
Subs, small	100 lbs.
Belt, 12-inch 6-ply	225 lbs.
Belt, 12-inch 5-ply	150 lbs.
Bull rope	175 lbs.
Brake and lever	292 lbs.
Sledges	14 to 16 lbs.
Hammer	2¼ lbs.
Crown pulley	231 lbs.
Monkey wrench	6 lbs.

WEIGHT OF IRON CASING BLOCKS.

Description.	Weight.
Triple blocks	450
Double blocks	350
Single blocks	200

WEIGHT OF DRILLING JARS.

Size of hole.	Diameter of Jars.	Stroke.	Weight.
10 and 8¼	5½ inches	4 to 5 inches	300 lbs.
6⅝ and 6¼	5		250 lbs.
5-inch hole	4½		200 lbs.
4-inch hole	3½		150 lbs.
3-inch hole	2¾		100 lbs.

WEIGHT OF LONG STROKE FISHING JARS.

Size of hole.	Stroke.	Weight.
6⅝-inch hole	36 to 40 inches	450 to 600 lbs.
5 -inch hole	36 to 40 inches	300 to 400 lbs.
4 -inch hole	36 to 40 inches	200 to 300 lbs.
3 -inch hole	36 to 40 inches	100 to 200 lbs.

WEIGHT OF WRENCHES FOR DRILLING TOOLS.

Size of hole.	No. of Wrenches in Set.	Weight per Set.
15, 13, 10 and 8¼ inches	2	1000 lbs.
6⅜ and 6¼	2	600 lbs.
5-inch hole	2	300 lbs.
4-inch hole	2	200 lbs.
3-inch hole	2	160 lbs.

WEIGHT OF WRENCHES FOR CLEANING OUT WELLS.

Heavy tools	2	250 lbs.
Light tools	2	150 lbs.

WEIGHT OF HYDRAULIC JACKS.

Power.	Weight.
90 tons	550 lbs.
60 tons	350 lbs.
30 tons	240 lbs.

JACKING RINGS AND SLIPS.

Size.	Weight.
10 inch	600
8 inch	575
6⅝ inch (small ring 275 lb.)	375
6 inch	350
5⅝ inch	360
5 3-16 in.	375
4⅞ inch	400
4 inch	450

SOLID REAMERS.

Size.	Weight.
10 inch hole	700
8 inch hole	550
6⅝ inch hole	400
5 inch hole	250
4 inch hole	150

HOLLOW REAMERS.

Size.	Weight.
10 inch hole	1000 lbs.
8 inch hole	800 lbs.
6¼ inch hole	600 lbs.
5 inch hole	400 lbs.
4 inch hole	250 lbs.

SPUDS, EIGHT FEET LONG.

Size.	Weight, Lbs.
10 inch hole	500
8 inch hole	300
6⅝ inch hole	200
5 3-16 in. hole	150
4 inch hole	100

LONG STEEL SPEARS, FOR SPEARING BY TOOLS.

Size.	Weight, Lbs.
10 inch hole, 50 feet long	2075
8 inch hole, 55 feet long	1650
6⅝ inch hole, 55 feet long	1260
5 3-16 in. hole, 58 feet long	1000

SLIP SOCKETS.

Size.	Wei
10 inch hole, short, 500	long, 700
8 inch hole, short, 300	long, 500
6½ inch hole, short, 200	long, 500
5 3-16 in. hole, short, 150	
4 inch hole, short, 50	

BELL SOCKETS.

Size.	Weight.
10 x 8 inch hole	450
8 x 6⅝ inch hole	325
6⅝ x 5 inch hole	200
5 x 4 inch hole	130

WEIGHTS AND MEASURES.

Troy Weight.

24 grains.....1 pwt. 12 ounces.....1 pound
20 pwts.....1 ounce
Used for weighing gold, silver and jewels.

Apothecaries' Weight.

20 grains.....1 scruple 8 drachms.....1 ounce
3 scruples.....1 drachm 12 ounces.....1 pound
The ounce and pound in this are the same as in Troy Weight.

Avoirdupois Weight.

27 11-32 grains...1 drachm 4 quarters.....1 cwt.
16 drams.....1 ounce 2000 pounds....1 short ton
16 ounces.....1 pound 2240 pounds....1 long ton
25 pounds.....1 quarter

Dry Measure.

2 pints.....1 quart 4 pecks.....1 bushel
8 quarts.....1 peck 36 bushels.....1 chaldron

Liquid Measure.

4 gills.....1 pint 31½ gallons.....1 barrel
2 pints.....1 quart 2 barrels.....1 hogshead
4 quarts.....1 gallon

Time Measure.

60 seconds.....1 minute 24 hours.....1 day
60 minutes.....1 hour 7 days.....1 week
28, 29, 30 or 31 days 1 calendar month.
(30 days 1 month in computing interest.)
365 days.....1 year 366 days.....1 leap year

Circular Measure.

60 seconds.....1 minute 30 degrees.....1 sign
60 minutes.....1 degree 90 degrees.....1 quadr.
4 quadrants 12 signs, or 360 degrees 1 circle.

Long Measure.

12 inches.....1 foot 40 rods.....1 furlong
3 feet.....1 yard 8 furlongs.....1 sta. mile
5½ yards.....1 rod 3 miles.....1 league

Cloth Measure.

2¼ inches.....1 nail 4 quarters.....1 yard
4 nails.....1 quarter

Mariners' Measure.

6 feet.....1 fathom 5280 feet.....1 sta. mile
120 fathoms.....1 c. length 6085 feet.....1 naut. mile
7½ cable lengths....1 mile

Miscellaneous.

3 inches.....1 palm 18 inches.....1 cubit
4 inches.....1 hand 21.8 in.....1 bible cubit
6 inches.....1 span 2½ feet....1 military pace

Square Measure.

144 sq. in.....1 sq. foot 40 sq. rods.....1 rood
9 sq. feet.....1 sq. yard 4 roods.....1 acre
30¼ sq. yards....1 sq. rod 640 acres.....1 sq. mile

Surveyor's Measure.

7.92 inches 1 link. 4 rods 1 chain.
25 links 1 rod.
10 square chains or 160 square rods, 1 acre.
640 acres, 1 square mile.
36 square miles (6 miles square) 1 township.

Cubic Measure.

1,728 cubic inches, 1 cubic foot. 128 cub. feet 1 cord (wood).
27 cubic feet, 1 cubic yard. 40 cubic feet, 1 ton (shpg.).
2,150.42 cubic inches, 1 standard bushel.
268.8 cubic inches, 1 standard gallon.
1 cubic foot, about four-fifths of a bushel.

METRIC EQUIVALENTS.

Linear Measure.

1 centimeter....0.3937 inch 1 inch.....2.54 centimeters
1 decimeter..3.937 inches / 0.328 feet 1 foot....3.048 decitmeters
1 meter.....39.37 inches / 1.0936 yards 1 yard.....0.9144 meter
1 dekameter....1.9884 rods 1 rod.....0.5029 dekameter
1 kilometer....0.62137 mile 1 mile....1.6093 kilometers

Square Measure.

1 sq. centimeter...0.1550 square inch 1 square inch..6.452 square centimeters
1 sq. decimeter....0.1076 square foot 1 square foot.9.2903 square decimeters
1 sq. meter..1.196 sq. yards 1 sq. yard..0.8361 sq. meter
1 are.....3.954 sq. rods 1 sq. rod.....0.2529 are
1 hektar.....2.47 acres 1 acre.....0.4047 hektar
1 sq. kilometer.....0.386 square mile 1 sq. mile.....2.59 square kilometers

Measure of Volume.

1 cubic centimeter..0.061 cubic inch 1 cubic inch....16.39 cubic centimeters
1 cubic decimeter..0.0353 cubic foot 1 cubic foot....28.317 cubic decimeters
1 cu. meter / 1 ster 1.308 cu. yds. / 0.2959 cd. 1 cu. yard..0.7646 cu. meter / 1 cord.....3.624 sters
1 liter 0.908 quart dry / 1.0567 quarts liquid 1 quart dry....1.101 liters / 1 quart liquid..0.9463 liters
1 dekaliter 2.6417 gallons / .135 peck 1 gallon....0.3785 dekaliter / 1 peck.....0.881 dekaliter
1 hektoliter..2.8375 bushels 1 bushel...0.3524 hektoliter

Weights.

1 gram.....0.0527 ounce 1 ounce.....28.35 grams
1 kilogram.....2.2046 lbs. 1 lb.....0.4536 kilogram
1 metric ton.....1.1023 English tons 1 English ton.....0.9072 metric ton

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APPROXIMATE METRIC EQUIVALENTS.

1 decimeter.....4 inches 1 liter 1.06 quarts liquid / 0.9 quarts dry
1 meter.....1.1 yards
1 kilometer....⅝ of a mile 1 hektoliter.....2⅝ bushels
1 hektar.....2½ acres 1 kilogram.....2 1-5 lbs
1 ster, or cubic meter ¼ of a cord 1 metric ton.....2,200 lbs

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RECORDS OF DRILLED WELLS IN ALL PARTS OF THE WORLD.

ADVICE ON OIL WELL RECORDS, AND THE PROPER WAY OF KEEPING THEM.

In preparing the following well records for publication the terms used in the originals have been retained as far as practicable. My experience is that the driller's record should never be dressed up to suit the views of the publisher. It may be imperfect, unscientific, and even inappropriate names may be used; but let the record stand as he gives it, then every one has an opportunity of making his own deductions from it. I always distrust a record that bears the earmarks of attempted improvements, for it is very seldom that these improvements are judiciously made; and, indeed, they are often decidedly misleading; as for instance, when the driller's "slate and shells" is persistently changed to "slate and shales." Drillers have

certain terms—not classical, but expressive and well understood by the craft and by oil men generally—"Sugar sand, clover seed, white sand, salt and pepper, chocolate sand, variegated, corn meal, Cow run, Dunkard, Trenton rock, blue Monday, salt sand, Maxon, Keener, boulder, Big Injun, Berea grit, Gantz, Gordon, fourth and fifth, Warren, Cherry Grove, Bradford, Kane and Elk sands and shells, slate and shells, soapstone," etc., and those who substitute other names should first be certain that they clearly comprehend the meaning of the originals.

A simple form has been adhered to throughout which brings out all the need facts (as far as they may be known) plainly and without unnecessary verbiage, to wit: name of well, date of completion, location, owners, authority for facts given and elevation above ocean—followed by an unbroken chain of thickness and depths of strata drilled through. The frequent appearance of interrogation marks where descriptions of materials should be shows in what fragmentary manner many of the records were kept. They cast no doubt upon the figures given, however, but simply indicate that the driller omitted to note what kind of rocks filled these intervals. For instance, if the driller's memorandum reads "struck first sand at 750 feet, sand 25 feet thick; struck second sand at 870 feet, sand 30 feet thick," it shows an interval of 95 feet between the sands—and as this is one of the links in the chain of depths it must be inserted, although the materials cannot be described.

The names of those who have kindly furnished records are given in plain Quaker fashion; and in making my grateful acknowledgments to the people of the oil regions for their zealous and cordial co-operation in furthering the interests of the OIL WELL DRILLER and for their many personal courtesies, I desire to especially refer them to those which appear in a similar connection in the former edition. Their numbers show the widespread interest that has been awakened; and also furnish a justifiable plea for my not attempting to particularize.

Many inquiries have been made, both verbally and by letter, as to the best methods of keeping well records and preserving sand pumpings.

I know of no better or more convenient form for a well register than that employed in the following pages. When records are kept in this manner mistakes are not likely to occur and one may always have before him the thickness of each rock division and the depth to both its top and bottom—with the tide water elevations, if the altitude of the well mouth is known. Every useful fact is plainly noted in its place and no mental calculations are required when any of them are wanted.

A very common, but satisfactory way of keeping a record is this:

Struck limestone at	320 feet
Through limestone at	335 feet
Top of hundred-foot at	1200 feet
Through hundred foot at	1280 feet
Top of thirty foot at	1340 feet
Through thirty foot at	1365 feet
Top of third sand at	1465 feet
Through third sand at	1500 feet

How much plainer do the facts stand out, and in the same number of lines when placed in this form, although the intervals can only be filled in with interrogation marks?

?	320' to 320'
Limetone	15' to 335'
?	865' to 1200'
Hundred foot	80' to 1280'
?	60' to 1340'
Thirty foot	25' to 1365'
?	100' to 1465'
Third sand	35' to 1500'

Another popular method consists of a simple enumeration of the kind of material drilled through, with the thickness of each bed and notes of measurements when important beds are struck, thus:

Soil	20 feet
Slate	130 feet
Sandstone	20 feet
Slate	30 feet
Struck limestone at	220 feet
Limstone	10 feet
Slate	50 feet etc., etc.

This form is good, provided no mistakes occur in the original record, nor in copying it from the driller's memoranda, which are generally pretty well blurred and defaced by the time the well is completed; but if mistakes should occur, there is no way of definitely locating them and the record may be ruined. In the last example, the four divisions overlying the limestone only aggregate 200 feet, yet the note says "struck limestone at 220 feet." Has one division of 20 feet been omitted, or has a figure 5 been mistaken in copying for a figure 3? It is impossible to decide or to positively locate the error. But if the record had been kept with the depths carried out in a second column and copied as below:

Soil	20' to 20'
Slate	130' to 170'
Sandstone	20' to 190'
Slate	30' to 220'
Limestone	10' to 230'

it would be seen at a glance that an error had been made between the depths of 20' and 170', and the inference would be that in the slate division 130 feet had been copied instead of 150 feet. At any rate, the mistake is located; and even if it be suspected that one division has been omitted, the integrity of the other parts of the record can be presented in this way:

Soil	20' to 20'
?	20' to 40'
Slate	130' to 170'

Records of this kind, even when supposed to have been kept with the greatest of care, can seldom be put into the two-column form and made to agree with the

checking points mentioned or the total depth of the well without more or less adjustment; and in some cases the discrepancies seriously affect the value of the record, or perhaps destroy all confidence in it. In this system there are no checks(or at least the driller does not take the trouble to foot up his figures as often as he should) and a mistake may readily be made and pass unnoticed until too late to properly correct it. But if the thicknesses and depths are both noted at the same time one is a check upon the other; any adjustment that may be required is made at the proper time and in the proper place; so that when the well is completed the record stands without a flaw. Therefore, by all means keep a consecutive register of both thicknesses and depths, since errors are less liable to occur in the original; and should they creep in at any time, can be corrected with confidence, and without jeopardizing the value of the whole record.

Preserving Specimens.—Wash the sand pumpings thoroughly, until no muddy water drains from them; dry immediately, but without roasting the materials; when dry, put a couple of ounces into a small, strong paper bag; number the bags consecutively as used and note the depth; note also the character of the material enclosed, whether hard or soft, clean or muddy, and any other item that may be of interest in connection with the well; fold each bag by itself, tie in convenient packages, and they are ready to be sent anywhere by mail or express whenever required. This is by far the most practical way of preserving specimens at wells.

Never put specimens in common letter envelopes; they are not gummed at the corners and invariably leak.

Never send bottles to a well, for they will be filled with wet sand pumpings, which are good for nothing. The depths will be indistinctly marked upon the corks which may have been changed from one bottle to another, or upon labels that refuse to adhere, and when the bottles return to you some will have been broken and lost and the remainder will be found in such a hopelessly disordered condition that they cannot be studied with any satisfaction or confidence.

Never send boxes of paper, wood or tin to a well. These are very popular, and I have received and examined many specimens put up in that way. But unfortunately it always happens that all the figures are noted upon the covers. Such specimens can only be compared by opening several boxes at one and the same time, and when all the boxes are alike some of the covers are sure to get misplaced. Specimens kept in this way are always of doubtful value.

Never put samples in boxes or bags with a loose slip of paper having the depth, etc., marked upon it, for the first person who examines them is likely to make unintentional transpositons of slips.

Never put up a shelf at the side of the derrick and make a row of little boxes to receive the sand pumpings in rotation, as they are saved, for every man who visits the well will take a pinch to examine and generally return it to the wrong apartment. By the time the well is completed the boxes contain a heterogeneous mixtures which are only a delusion and a snare to those who may attempt to make deductions from them.

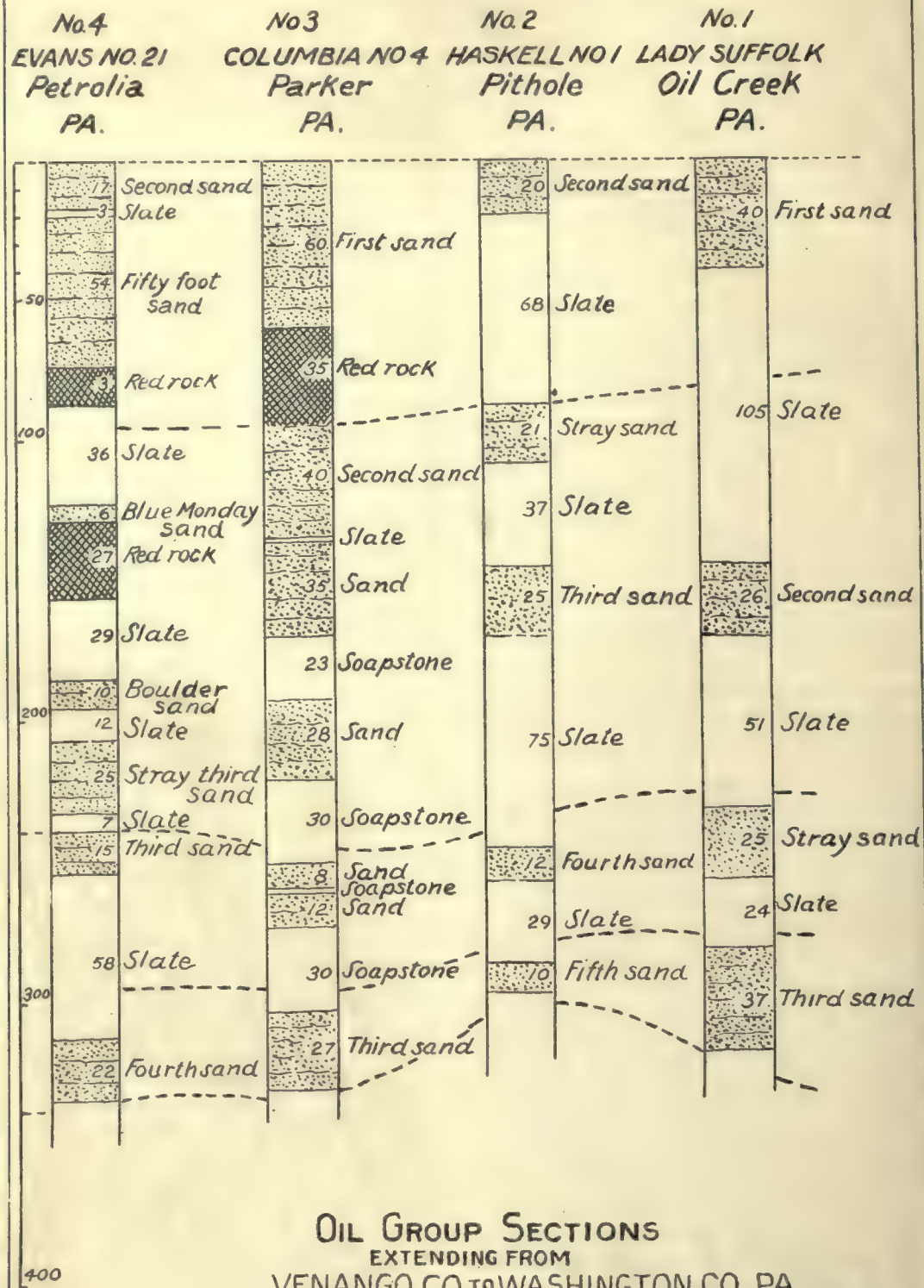
Never keep specimens in a box divided into several rows of small compartments, or in several rows of an augur hole bored into a plank, and don't nail narrow strips or boards on the main sill or engine block brace (bumper brace) along the belt house, in small compartments the jar caused by pulling out the drilling tools or bailing out the hole will cause the sand to move from one compartment to another, thereby the sand becomes mixed as mentioned. This plan is even more objectionable than one single row of apartments, since the depths will sometimes be marked on one side and sometimes on another, and when an attempt is made to arrange the material in order it is not always clear to which box the figures refer.

Never suppose that you will get a satisfactory representation of the strata drilled through by charging a glass tube with the sand pumpings. The theory looks good, but did any one ever see a glass tube prepared in this way, whether by a driller or by an accomplished expert, that was of any practical value? I have examined many, some of them having been prepared at considerable expense, and as supposed, with great care, but I never saw one that accomplished what was intended, or that was of any special use in studying the geology of oil wells.

I am impelled to be thus prolix in these apparently trivial matters by recollections of my experiences, of my disappointments, of my griefs. I have frequently driven 10 or 15 miles to examine some locally noted "complete set of sand pumpings," with the expectation, or at least the hope of getting information on some important feature of structure not clearly brought out in the ordinary records, and always returned foiled and disheartened; having invariably found that the specimens were worthless in any special or definite study, on account of the unreliable manner in which they had been preserved.

To secure a complete set of sand pumpings it is necessary to save some sediment after each and every full screw run. Bag the specimens; number the bags and mark them provisionally, three feet, five feet, or whatever depth the driller thinks the bit has penetrated. Measure up occasionally at important changes in the rocks, and if the provisional measurements on the bags do not tally with the actual measurements, correct them judiciously and re-mark the bags permanently, keeping a written record all the while. When the samples are brought to the office and bottled for use, they can be so arranged that nearly every bottle (I use half ounce square bottles) may represent five feet in the well, and thus, when numbered and placed side by side upon a shelf a complete columnar section of the well is presented and every portion of the material is easily accessible for examination.

The common way of saving one specimen to represent each kind of rock drilled through is good as far as it goes; but its value, of course, depends entirely upon the judgment of the driller, as he decides where one rock ends and another commences and selects the specimen which is to be considered typical of the whole stratum. In well pronounced beds of sandstone, limestone or slate, these selections can easily be made;



Oil Group Sections

EXTENDING FROM

VENANGO CO. TO WASHINGTON CO. PA.

TO ILLUSTRATE THE STRUCTURAL VARIATIONS OF THE VENANGO-BUTLER OIL SANDS GOING SOUTWESTERLY

but there are horizons of mixed sediments (and they are generally important horizons) where even a geologist might make mistakes if he neglected to properly test the materials. These intervals are seldom properly represented by the driller's samples. For instance, in localities where the Ferriferous limestone is very thin and shaly and lies enclosed in a bed of dark slaty shale—a specimen of the shale is preserved, the limestone is passed unnoticed, the whole mass is recorded as shale, and the position of a very important stratum is overlooked. Or in places where the Silicious limestone blends so deftly with the underlying sandstone and acts so much like a sandstone under the drill that it is generally counted as one continuous rock—if a sample be taken from the upper part we have a silicious limestone, if from the lower part a pure sandstone, and neither correctly represents the whole of the stratum described in the record. Therefore, it is safer and more satisfactory, whenever the beds are of considerable thickness or at all doubtful in composition, to take specimens every 10 or 15 feet, although the naked eye can detect but little variation in the sand pumpings.

PENNSYLVANIA WELL RECORDS.

Jonathan Watson, Flats well No. 1, East Titusville, Pa.; Williams, Tanner, Watson & Co., owners.—The well was known at that date as the Williams well. It was drilled in the first sand March, 1860, and produced 10 barrels of oil a day. After producing for three months the well was drilled down to the second sand and began to flow at the rate of 200 barrels of oil a day, July 7, 1860. From the fact that the Williams well was a flowing one after drilling it down to the second sand, it was renamed the Fountain well which name it was known by until it was abandoned because of its small production and the low price of oil about 15 years ago. In 1902 Schlosser and Yankee leased the land that the old Fountain well was on. They cleaned out the old hole and put in a string of casing and shot the well in February, 1903. It flowed and caught fire from the drilling machine, which burned up. After the well was cleaned out and put to pumping it began to produce 10 barrels of oil each 24 hours.

Record of Barnsdall, Mead, Rouse & Co. well No. 1, Jonathan Watson flats, Titusville, Pa.

Drive pipe, 47 feet; depth of well, 116 feet. The well produced 600 gallons of oil on an average a day. Well commenced pumping on the first day of February, 1860, and in four months 56,000 gallons of oil was sold for $16,800. The oil sold at 30 cents a gallon at the well. The cost of the well was $3,000. First well to drive pipe with a battering ram or wooden maul.

Record of the first well drilled in the Oil City, Pa., oil field.

Nearly opposite the mouth of Oil creek, now South Oil City, on the bank of the Allegheny river, in February, 1860, Phillips, Frew & Co. started to drill the first well in Oil City on April 5, 1860. The well was drilled in the sand at a depth of 197 feet. It produced 42 barrels of oil the first 24 hours, which sold at 50 cents a gallon, and was the cause of one of the greatest excitements on the Allegheny river. It was the beginning of the boom of the world's famous oil town of Oil City.

Record of the first well drilled at Warren, Pa., John Kitchen lot well No. 1, on the east side of Conewango creek near the Conewango creek dam.

The well was drilled in the spring of 1860. A small show of oil was found at 500 feet deep, but for the lack of funds the well was not drilled deeper and was soon abandoned.

Record of the second well drilled at Warren.

The well was drilled on the old Tanney lot, later known as the Truby lot, near the Pennsylvania avenue millrace bridge. The well was drilled in the summer of 1860 to a depth of 600 feet and abandoned as a dry hole.

Record of the third well drilled at Warren, and the first well to produce oil; David Beatty farm well No. 1; David Beatty, owner.

Began drilling January, 1875; on March 12, 1875, oil was struck at a depth of 640 feet in a sand that was named the Beatty or Glade sand. The well was shut down and held as a mystery, but on the morning of March 13, 1875, the well flowed over the derrick and over the snow hundreds of feet away. The well produced 10 barrels of oil a day. It was drilled in search of natural gas to supply Mr. Beatty's residence with fuel.

Record of the first Speechley or gas sand well drilled.

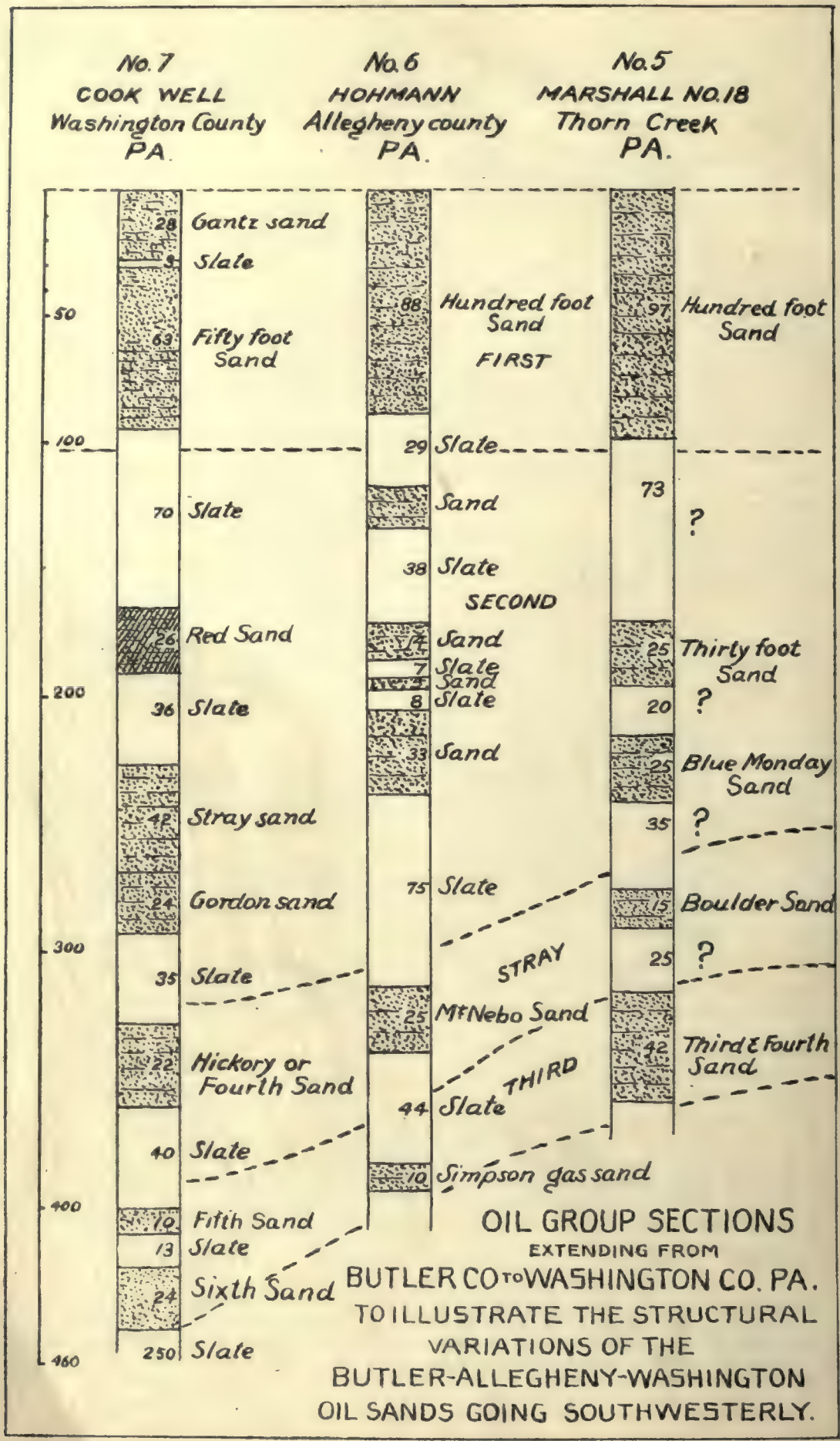
In January, 1885, Samuel Speechley started a well on his farm near McPherson, Coal Hill postoffice, Pine Grove township, Venango county, nine miles east of Oil City, intending to drill three thousand feet deep in search of the Bradford sand. On April 13, 1885, at 900 feet below the third sand the Speechley or gas sand was found. The well had a pressure of 600 pounds to the square inch. Oil City, Franklin and a number of other towns in Pennsylvania are supplied with natural gas from this sand.

Record of Calaboose and Cornplanter tract well No. 46, Chamberlain farm, two miles northeast of Oil City; Chambers Trust estate, owners.

Eight inch conductor, 20 feet; 5⅝ inch casing, 325 feet; top of second sand, 778 feet; bottom of second sand, 802 feet; top of third sand, 823 feet; bottom of third sand, 935 feet; total depth of well, 940 feet. Well shot in second sand with 40 quarts of nitro-glycerin. Well shot in third sand with 20 quarts of nitro-glycerin. Production first 24 hours, 10 barrels of oil. G. W. Schneider, superintendent.

Record of Rollins farm well No. 4, Kinzua; Smith, Bright and Borchers.

Eight inch drive pipe, 72 feet; 5⅝ inch casing, 190 feet; top of the oil sand, 650 feet; first pay, 653 feet.


No. 7
COOK WELL
Washington County
PA.
No. 6
HOHMANN
Allegheny county
PA.
No. 5
MARSHALL NO. 18
Thorn Creek
PA.
28 Gantz sand
9 Slate
50
63 Fifty foot Sand
100
70 Slate
26 Red Sand
200
36 Slate
42 Stray sand
24 Gordon sand
300
35 Slate
22 Hickory or Fourth Sand
40 Slate
400
10 Fifth Sand
13 Slate
24 Sixth Sand
250 Slate
460
88 Hundred foot Sand
FIRST
29 Slate
Sand
38 Slate
SECOND
Sand
7 Slate
Sand
8 Slate
33 Sand
75 Slate
STRAY
25 McNebo Sand
THIRD
44 Slate
10 Simpson gas sand
97 Hundred foot Sand
73
?
25 Thirty foot Sand
20 ?
25 Blue Monday Sand
35 ?
15 Boulder Sand
25 ?
42 Third & Fourth Sand
OIL GROUP SECTIONS
EXTENDING FROM
BUTLER CO TO WASHINGTON CO. PA.
TO ILLUSTRATE THE STRUCTURAL
VARIATIONS OF THE
BUTLER-ALLEGHENY-WASHINGTON
OIL SANDS GOING SOUTHWESTERLY.

Well began flowing at 662 feet. Total depth of well, 668 feet. Well flowed first 24 hours, 140 barrels of oil. Well finished December 15, 1885.

Record of Smith, Bright and Borcher's farm well No. 6, Billy's run, opposite Kinzua, Glade township, Warren county.

Eight inch conductor, 27 feet; 5⅝ inch casing, 227 feet; top of oil sand, 888 feet; first oil pay, 897 feet. Well began flowing at the rate of 200 barrels of oil each 24 hours. Total depth of well, 923 feet. Well finished February 7, 1887.

Record of Rogers Farm Oil Co. well No. 1, Rogers farm, Morrison run, Warren county.

Eight inch conductor, 16 feet; 5⅝ inch casing, 163 feet; top of Glade sand, 1020 feet; bottom of Glade sand, 1055 feet; top of Gartland sand, 1165 feet; bottom of Gartland sand, 1177 feet; total depth of well, 1192 feet. Production, one barrel a day. G. W. Schneider and F. H. Trap, owners.

Record of Rockwell and Gilbert well No. 1, Deer Lick oil field, Warren county.

Eight inch conductor, 20 feet; 5⅝ casing, 250 feet; Cherry run sand, 1720 feet; gas sand, 1872 feet; Deer Lick sand, 1970 feet; total depth of well, 1980 feet. Production of well first 24 hours, 600 barrels of oil.

Record of Mead tract well No. 25, Henry's Mills, Warren county; Jamison, Bright and Borchers.

Conductor, 18 feet; 5⅝ inch casing, 435 feet; Clarendon sand, 1369 feet; second sand, 1470 feet; top of Cooper sand, 1687 feet; bottom of Cooper sand, 1707 feet; total depth of well, 1707 feet. Well finished November, 1900. Production first 24 hours, 25 barrels of oil.

Record of well No. 10, D. Grimm farm, Point Hill, near Franklin.

Driving pipe, 8 inch, 19 feet; casing 5⅝, 205 feet; top of sand, 565 feet; bottom of sand, 617 feet; whole depth (pocket), 643 feet. The above is a record of a first sand Franklin lubricating oil well, drilled in June, 1898, and started to pump at the rate of one barrel daily. D. Grimm, owner. Record by D. Grimm and Son.

Record of well No. 14, tract 35, D. Grimm farm, Franklin, Pa.; D. Grimm, owner. Drilled by Elmer Keeley and shot with 30 quarts of nitro-glycerin on December 20, 1898. Started pumping at the rate of 60 barrels per day.

Conductor, 32 feet; casing, 6¼ inch, 246 feet; bottom of first sand, 547 feet; top of second sand, 628 feet; bottom of second sand, 651 feet; total depth, 700 feet. Record by D. Grimm and Son.

Record of Bowersock farm well, 1½ miles southeast of Oil City; Chambers Trust estate, owners.

Eight inch conductor, 10 feet; 5⅝ inch casing, 300 feet; Mountain sand, 470 to 500 feet; top of first sand, 695 feet; small show of oil, 700 feet; bottom of first sand, 740 feet; top of second sand, 845 feet; oil in second sand, 850 feet; bottom of second sand, 869 feet; gray and third sand run together, 979 feet; show of oil, 998 feet; total depth of well, 1055 feet. Well was shot in second sand with 23 quarts of nitro-glycerin, in the third sand with 26 quarts. Production two barrels a day. Well drilled October, 1901. G. W. Schneider, superintendent.

Record of Cracker lot well No. 50, Good Will Hill, Grand Valley oil field, Warren county; John Bright and Sons, owners.

Eight inch conductor, 15 feet; 5⅝ inch casing, 341 feet; first sand, 574 feet; top of second sand, 703 feet; bottom of second sand, 715 feet; top of third or Grand Valley sand, 804 feet; bottom of pay, 824 feet; total depth of well, 846 feet. Production first 24 hours, 18 barrels of oil. Well finished May 19, 1902.

Record of Gray sand district, 7 miles east of Oil City, Humboldt C well; Chambers trust estate, owners.

Eight inch conductor, 16 feet; 5⅝ inch casing, 326 feet; second sand, dry, 810 feet; top of Gray sand, 952 feet; total depth, 981 feet. Under this territory is found the Speechley or gas sand. It is found 950 feet below the Gray sand. Well shot with 40 quarts of nitro-glycerin. Production first 24 hours, 10 barrels. Well drilled, 1902. G. W. Schneider, superintendent.

Record of well No. 32, tract 66, D. Grimm farm, Cranberry township, Venango county.

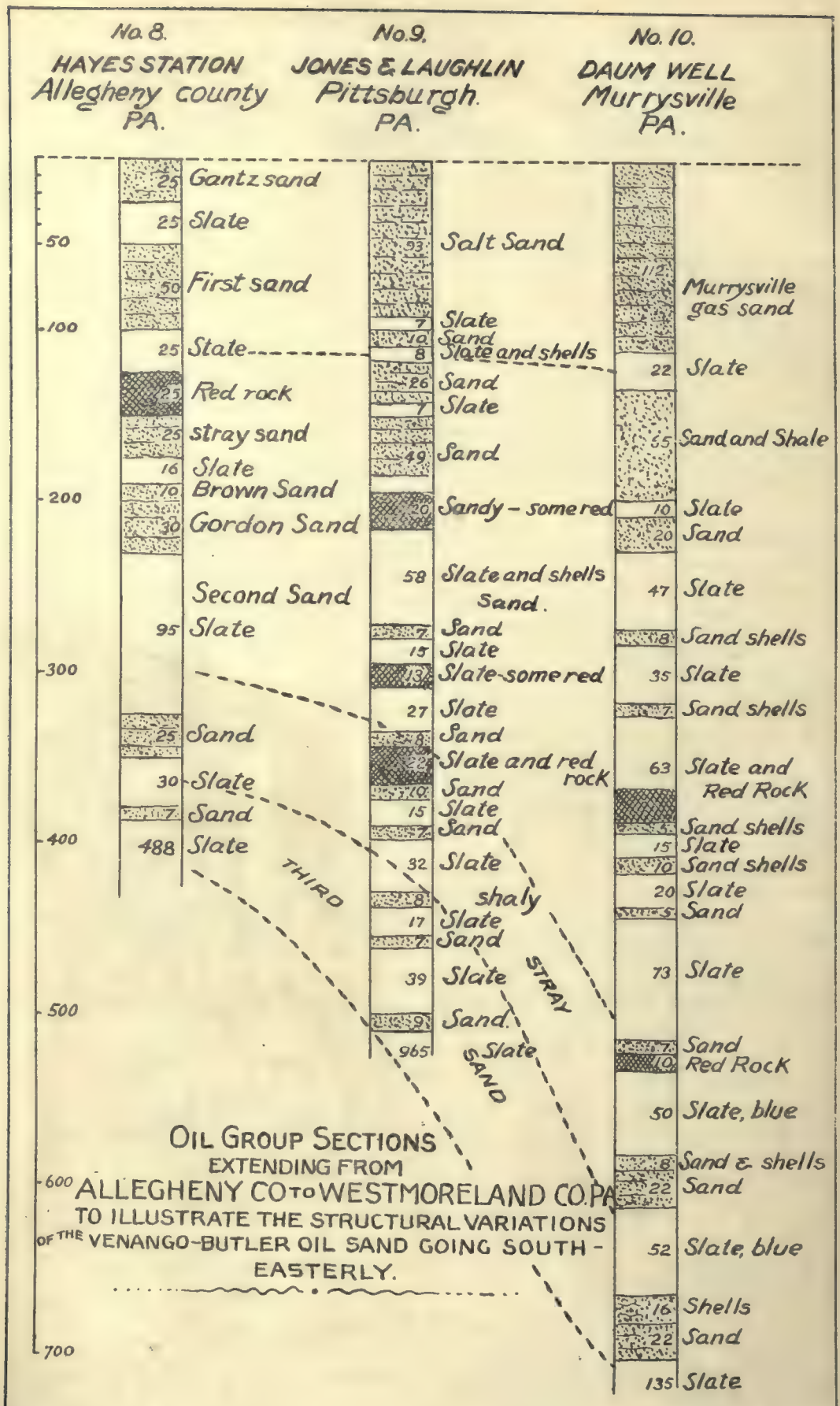
Conductor, 8 inch, 12 feet; casing, 6¼ inch, 354 feet; top of first sand, 717 feet; water in first sand, 729 feet; bottom of first sand, 767 feet; top of second sand, 867 feet; bottom of second sand, 895 feet; top of Gray sand, 994 feet; bottom of Gray sand, 1020 feet; total depth, 1055 feet; 53 feet liner, 4¼ inch casing set in bottom of hole; liner in second sand 28 feet 5 inches; casing setting on 5⅝ inch shoulder; 440 feet of 4¼ inch casing disconnected and set on top of second sand liner to shut off the salt water of first sand, with 6¼ inch leather cup, collar on top with left hand screw; shot with 80 quarts in the Gray sand and 15 quarts in the second sand by T. M. Agnew on September 9, 1902. Drilled by J. B. Hayslett, contractor. Tubed and started to pump September 11, 1902. Started to pump at 25 barrels a day. Record by D. Grimm and Son.

Record of Bell lot No. 77, well No. 16, 4 miles southwest of Oil City; Chambers Trust estate, owners.

Eight inch conductor, 14 feet; 5⅝ casing, 320 feet; top of second sand, 850 feet; bottom of second sand, 876 feet; total depth of well, 916 feet. Well shot with 40 quarts of nitro-glycerin. Production first 24 hours, 30 barrels of oil. G. W. Schneider, superintendent.

Record of McClintock farm well No. 17, Rouseville; Puriton Oil Company.

Eight inch conductor, 15 feet; 6¼ casing, 112 feet; first sand, 252 feet; top of second sand, 423 feet; bottom of second sand, 423 feet; top of third sand, 543 feet; bottom of third sand, 560 feet; total depth, 620


No. 8.
HAYES STATION
Allegheny county
PA.
No. 9.
JONES & LAUGHLIN
Pittsburgh.
PA.
No. 10.
DAUM WELL
Murrysville
PA.
25 Gantz sand
25 Slate
50
50 First sand
100
25 State
25 Red rock
25 stray sand
16 Slate
10 Brown Sand
200
30 Gordon Sand
Second Sand
95 Slate
300
25 Sand
30 Slate
7 Sand
488 Slate
400
500
600
700
93 Salt Sand
7 Slate
10 Sand
8 Slate and shells
26 Sand
7 Slate
49 Sand
20 Sandy – some red
58 Slate and shells
Sand.
7 Sand
15 Slate
13 Slate-some red
27 Slate
8 Sand
22 Slate and red rock
10 Sand
15 Slate
7 Sand
32 Slate
8 shaly
17 Slate
7 Sand
39 Slate
9 Sand.
965
112 Murrysville gas sand
22 Slate
65 Sand and Shale
10 Slate
20 Sand
47 Slate
8 Sand shells
35 Slate
7 Sand shells
63 Slate and Red Rock
Sand shells
15 Slate
10 Sand shells
20 Slate
5 Sand
73 Slate
7 Sand
10 Red Rock
50 Slate, blue
8 Sand & shells
22 Sand
52 Slate, blue
16 Shells
22 Sand
135 Slate
THIRD
SAND
STRAY
SAND
OIL GROUP SECTIONS
EXTENDING FROM
ALLEGHENY CO TO WESTMORELAND CO. PA
TO ILLUSTRATE THE STRUCTURAL VARIATIONS
OF THE VENANGO-BUTLER OIL SAND GOING SOUTH-
EASTERLY.

The Edwin H. Fitler Company

WILLIAM W. FITLER
President and Treasurer

N. MYERS FITLER
Vice-President

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CORDAGE WORKS

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Drilling Jars

The Best Made



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and

Sockets

Hollow Reamers

And Anything in

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Fishing Tool

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ORDER

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H. W. RANK, McDonald, Pa.



Bell Phone 7 — **Consolidated, 84**

S. W. MUNN

OIL WELL FISHING TOOLS

Mannington - - - - West Virginia

feet. Production first 24 hours, five barrels. Well drilled February, 1903. Record by Samuel Reynolds, driller; William Moyer, contractor.

Record of the first fifth sand well drilled in Allegheny county; N. D. Jones and J. M. Patterson, owners; Joseph J. McCurdy farm well No. 1, McCurdy.

Began drilling August, 1890; conductor, 16 feet; 8¼ casing, 244 feet; 6¼ casing, 1024 feet; top of the hundred foot sand, 1815 feet; bottom of the hundred foot sand, 1900 feet; top of the thirty foot sand, 1982 feet; good show of oil, 2002 feet; bottom of the thirty foot sand, 2024 feet; top of Gordon sand, 2085 feet; no oil, little gas; bottom of Gordon sand, 2118 feet; top of fourth sand, 2132 feet; bottom of fourth sand, 2153 feet; top of fifth sand, 2215 feet; 6 feet in the sand the well started to flow at the rate of 25 barrels each hour; best well on the farm produced 125 barrels an hour; 10 wells were drilled on the farm. Well completed October, 15, 1890.

Record of the largest oil well struck in Pennsylvania and largest white sand oil well in the world; Greenlee and Forst, owners; James Mevey farm well No. 1; McDonald oil field; well located three-fourths of a mile northeast of McDonald.

Began drilling July, 1891; top of Gordon sand, 2180 feet; bottom of Gordon sand, 2202 feet; top of fifth sand, 2300 feet; bottom of fifth sand, 2316 feet; well drilled in fifth sand Saturday, September 26, 1891; Monday, September 28, 1891, the well produced 15,600 barrels of oil in 24 hours. South Penn Oil Co., present owners.

Record of Adams farm well No. 6; Fisher Oil Co.; Cliff Mines, Allegheny county.

Conductor, 19 feet; 8¼ casing, 305 feet; 6¼ casing, 935 feet; 4⅞ casing, 1780 feet; top of hundred foot sand, 1739 feet; bottom of hundred foot sand, 1780 feet; top of thirty foot sand, 1863 feet; bottom of thirty foot sand, 1881 feet; top of Gordon sand, 1898 feet; bottom of Gordon sand, 1933 feet; top of fourth sand, 2010 feet; bottom of fourth sand, 2070 feet; total depth, 2080 feet; dry hole. Record by J. W. Chrispen, driller.

Record of the largest oil well struck in the McCurdy oil field; W. H. Kelso farm well No. 2; McCurdy, Allegheny county; N. D. Jones, owner.

Drilled in the fifth sand October 27, 1891. Produced 330 barrels each hour. N. D. Jones drilled 48 wells in the McCurdy oil field, only two being dry holes. Both dry holes drilled in 1896. The sand was drained by the larger wells drilled five years before.

Record of Nancy Gibson farm well No. 5; Devonian Oil Co.; Wildwood oil field, Allegheny county.

Conductor, 15 feet; 8¼ casing, 318 feet; 6¼ casing, 790 feet; 4⅞ casing, 1507 feet; top of third sand, 1844 feet; oil pay in third sand, 1850 to 1868 feet; total depth, 1868 feet. Well began flowing 125 barrels of oil each hour May 19, 1897. A. W. Leonard, contractor.

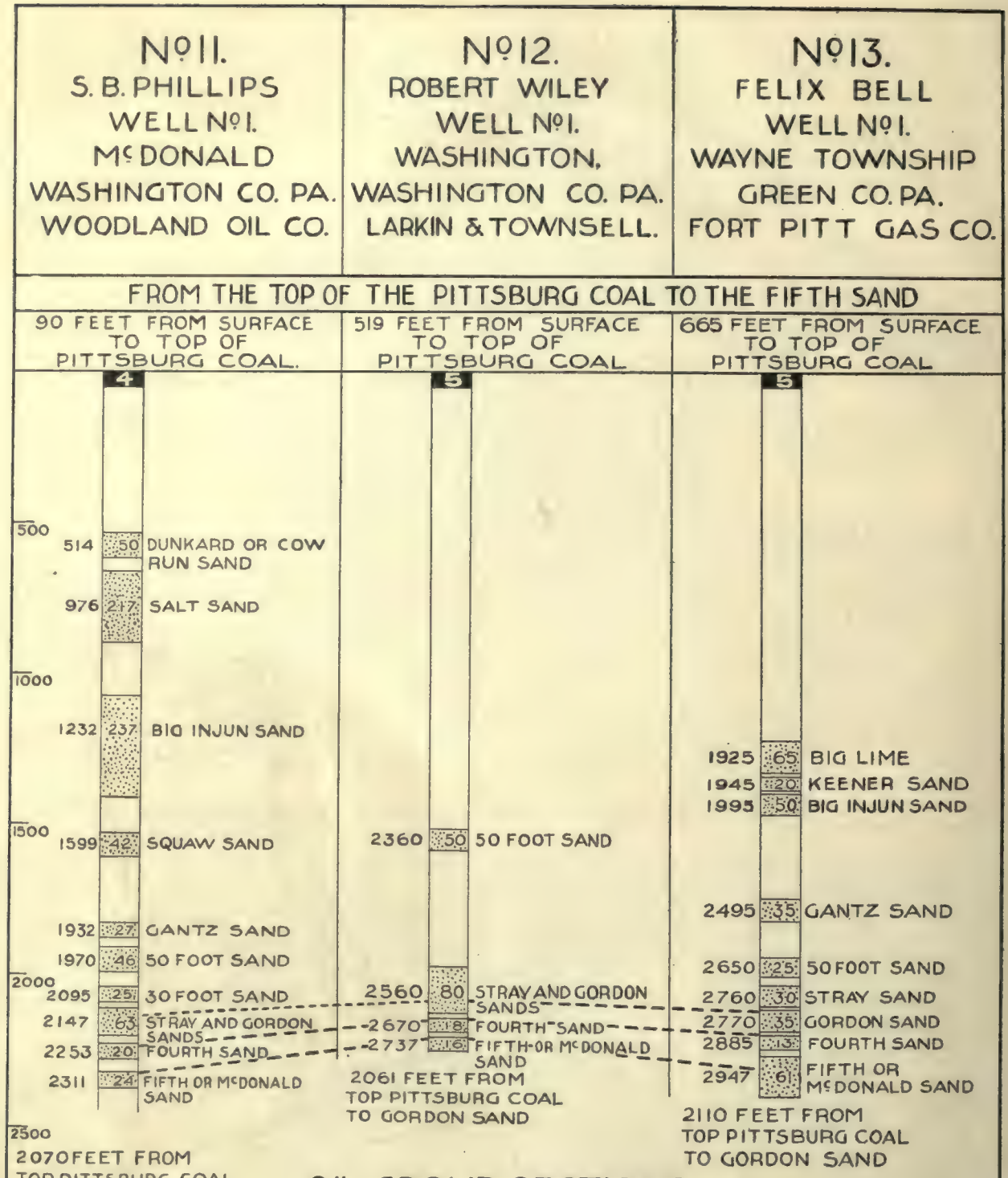
Record of Mary Boyle farm well No. 4; Devonian Oil Co.; Wildwood oil field, Allegheny county.

Conductor, 16 feet; 10 inch casing, 335 feet; 8¼ casing, 740 feet; 6¼ casing, 1640 feet; hundred foot sand, 1690 to 1800 feet; third sand, 1881 to 1890 feet; fourth sand, 1935 feet; oil in fourth sand 1951 feet; total depth, 1968 feet; production first 24 hours, 25 barrels. Well finished August, 1897. A. W. Leonard, contractor.

Record of the deepest cable drilled well in the world; William Bedell farm well No. 1; Peters creek, 2½ miles west of West Elizabeth, Allegheny county, and 12 miles southeast of Pittsburg. Forest Oil Company, owners.

Began drilling, 1895; the well was 115 feet below the Pittsburg coal; conductor, 15 feet; 8¼ inch casing, 320 feet; 6¼ inch casing, 960 feet; fifth sand, 2285 feet; 10 feet of sand; struck gas in top of fifth sand; sixth sand, 2395 feet; 15 feet of broken sand; the well was drilled 4509 feet deep and shut down. J. G. Clark and Reed Banks were the drillers, and J. P. Fishel, contractor.

The well was shut down for one year, during which time lightning struck the derrick and burned the rig. In a short time the Forest Oil Co. decided to build a new rig over the hole. It was built extra large and strong, with a set of bull wheels, two brakes and three grooves for three bull ropes, and drill the well down in search of the Bradford sand. The men hired by the Forest Oil Company to drill the well from 4509 feet to 5582 feet deep were Drillers Samuel W. Coleman and Cliff Young of McDonald, Pa.; tool dressers, Henry A. Stroup and Eugene O'Brien of McDonald. The well was started to be drilled down in 1896. It made gas enough from the Elizabeth sand for fuel to drill with and for lights. At a depth of 5275 feet the machinery became too light and small to handle the tools. It then became necessary to put in extra heavy machinery. Two 25 horse power boilers, two engines, one 15 horse power and the other 30 horse power were used. They were coupled together. The tug pulley or belt wheel end of the shaft of one engine was coupled by a flange union to the balance or fly wheel end of the shaft of the other engine. The engines were arranged similar to the locomotive engines which have no dead center. The two boilers were connected together with 3-inch steam line which ran to a 3-inch throttle in the engine house, then to a 3-inch tee; 2½ connections were made to the 30- horse power engine and 2-inch connections were made to the 15 horse power engine. Both engines were governed by one 3-inch throttle. One 16-inch belt, three 2½-in. bull ropes, one 13½-foot band wheel, one 5-inch forged shaft and crank, one set 4½-foot flanges were used and two cables spliced together, making about 6,000 feet. One cable 2¼ inches in diameter and weighing 5,600 pounds was used at the bottom of the well, and the cable that was used on the top of the hole was 2⅞ inches in diameter and weighed 8,400 pounds, making a total weight of cable of 14,000 pounds, which would represent a value of about $2,250. The size of the hole was 6⅛ inches and the tools used were the ordinary



OIL GROUP SECTIONS

EXTENDING FROM

McDONALD, WASHINGTON CO. TO GREEN CO. PA.

TO ILLUSTRATE THE STRUCTURAL VARIATIONS FROM THE TOP OF THE PITTSBURG COAL TO THE FIFTH SAND OF THE WASHINGTON AND GREEN CO. OIL SANDS GOING SOUTHWEST.

drilling tools used in 6¼ holes. On Saturday night June 30, 1897, before shutting down for the week the well was measured with a steel measuring line. The hole measured 5,582 feet deep. This was the last measurement made of the well. On Monday morning, July 2, 1897, while springing the tools to bottom the crown pulley on top of the derrick broke and cut the cable and dropped the tools. The tools have never been fished out. The approximate cost of the well was about $40,000.

Record of Robert and Henry Garraux farm well No. 1, Bakerstown oil field, Allegheny county. Devonian Oil Company.

Began drilling, 1901; conductor 13 feet; 10 inch casing, 122 feet; 8¼ casing, 770 feet; top of the hundred foot sand, 1547 feet; bottom of the hundred foot sand, 1639 feet; 6¼ casing, 1645 feet; top of the boulder sand, 1792 feet; gas in boulder sand, 1796 feet; break in boulder sand, 1800 to 1803 feet; oil in boulder sand, 1817 to 1827 feet; second pay in boulder sand, 1831 to 1840 feet; total depth of well, 1843 feet; finished well July 3, 1901. Production 10 barrels an hour. Present production, 45 barrels a day. A. W. Leonard, contractor.

WEST VIRGINIA WELL RECORDS.

Record of the first well drilled in Virginia, now West Virginia, exclusively for oil. It was drilled by the lever system, by C. H. Shattuck, now of Parkersburg, W. Va. The well was drilled on a 10-acre tract of land he purchased from Bushrod Creel at the Sand Diggings, on Hughes river, 22 miles east of Parkersburg, on the Stanton and Parkersburg turnpike. The well was drilled 300 feet deep in November, 1859, and proved to be a dry hole. This well was drilled 59 days after the Drake well at Titusville, Pa. Record by C. H. Shattuck, Parkersburg, W. Va.

Record of the first well drilled on Oil Spring run, Ritchie county; Ford and Hanlon, owners.

Began drilling with spring pole May, 1861. Well finished through the salt sand 300 feet deep November, 1861. Well put to pumping December, 1861, and produced five barrels of oil a day.

Record of the first well drilled at Volcano, White Oak run, Wood county; W. W. Harkness, owner.

Began drilling May, 1865; conductor hole 10 feet deep; square 8 inch conductor box 10 feet; top of gas sand 10 feet; bottom of gas sand 30 feet; top of salt sand 250 feet; first show of oil 255 feet; slate in salt sand 295 to 305 feet; oil in second salt sand, 310 feet; drilled through the salt sand, 355 feet; well put to pumping August, 1865 pumped 10 barrels a day.

Record of the first well drilled in the Big Injun sand in the Mannington oil field; Flaggy Meadow Oil Company; D. F. Hamilton farm well No. 1.

Began drilling May, 1889; the record of the casing and hole is lost. The Flaggy Meadow Oil Company was composed of M. B. Montgomery, of Washington, Pa., and the Jackson Oil and Gas Company, which was composed of Prof. I. C. White, of Morgantown, W. Va.; T. M. Jackson, of Clarksburg, W. Va.; Gen. C. L. Smith, of Fairmont, W. Va.; A. L. Prichard and A. W. Prichard, of Mannington. The well was drilled into the Big Injun sand October 3, 1889 and plugged with a home made plug and filled up with broken stone and sand and worked as a mystery; but a few days after being plugged the well raised a pressure of gas and blew the plug and stone and sand out, and flowed on the ground at the rate of 10 barrels a day. In a second attempt to plug the well for a mystery the well was ruined. After a long fishing job the well was abandoned. Contractors, Barrows and Dugan. The Jackson Oil and Gas Company had 20,000 acres of land under lease for oil and gas and in a short time sold their holdings to the South Penn Oil Company for a large sum.

Record of the second well drilled in the Big Injun sand in the Mannington oil field; Burt Oil Company; Burt farm, Daisy well No. 1.

Began drilling October 18, 1889. 13 inch conductor, 16 feet; 10 inch casing, 200 feet; 7⅝ inch casing, 950 feet; 4⅞ inch casing, 1624 feet; top of Big Injun sand, 1745 feet; first oil pay, 1815 feet; second oil pay, 1825 feet; total depth, 1836 feet. Produced 250 barrels of oil first 24 hours. Well finished April 5, 1890. F. M. Wright, contractor.

Record of Johnny Smith farm well No. 1; Gorrel run, Tyler county; Owls Head Oil Company.

Began drilling 1890. conductor, 10 feet; 10 inch casing, 350 feet; 8¼ inch casing, 800 feet; 6¼ inch casing, 1500 feet; Big Lime, 1800 feet; show of oil and water together, 1840 feet; 4⅞ casing, 1900 feet. The well was drilled through the Gordon sand 2810 feet and abandoned as a dry hole. Drillers, John Goodwin and Wilkes Hoag; tool dressers, Will Smith and Peter Hasson. The well was plugged in the red rock cave and the rig was moved.

On the second hole while spudding, Wilkes Hoag, the driller on tour then, was sitting on the driller's stool, the extra crown pulley and block, used for putting in casing, fell from the top of the derrick and broke both of his legs. One was amputated below the knee; he lived only three days. Harry Doyle took Mr. Hoag's place on the well. This was the first deep well drilled in Tyler county. At that date it was not known that oil and salt water could be produced together on a paying basis from the Big Injun sand in Tyler county. Well drilled in 1890. Palmer and Davis, contractors.

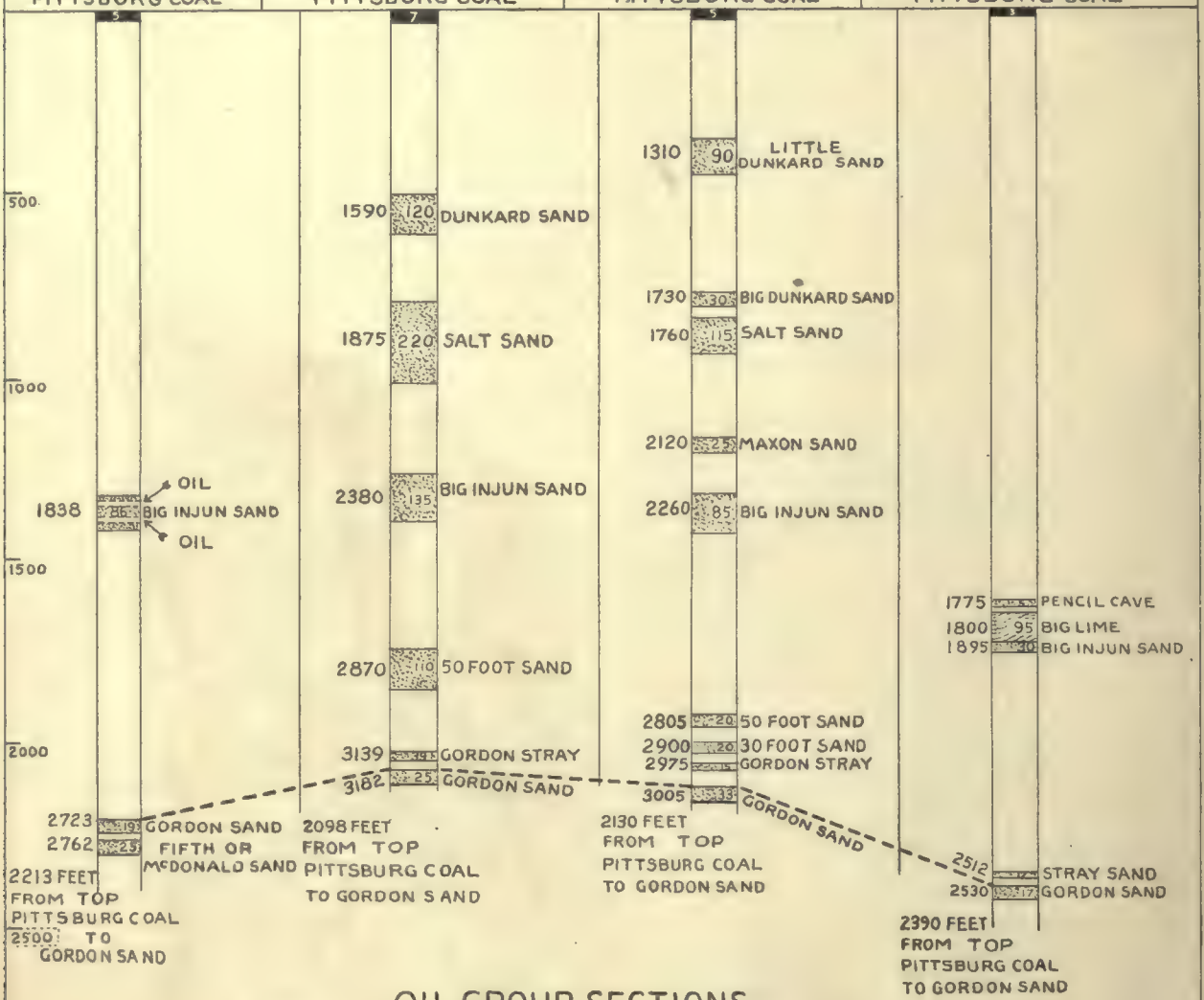
Record of the first well drilled to the Gordon sand in West Virginia; Mannington oil field; Burt Oil Company; Burt farm well No. 14.

Began drilling May, 1891; 13 inch conductor, 16 feet; 10 inch casing, 255 feet; Pittsburg coal, 505 to 512 feet! 7⅝ casing, 1030 feet; 5⅝ casing, 1782 feet; 4¼ liner, 225 feet; top of Big Injun sand, 1838 feet; first oil pay, 1914 feet; second oil pay, 1924

Nº14	Nº15	Nº16	Nº17
BURT FARM	Z.M.PRICE FARM	J.LOUGH FARM	M.COPLEY HEIRS FARM
WELL Nº14	WELL Nº2	WELL Nº1	WELL Nº1
MANNINGTON	FOLSOM	MARSHVILLE	SAND FORK
MARION CO WEST VA.	WETZEL CO.WEST VA	HARRISON CO.WEST VA	LEWIS CO.WEST VA.
BURT OIL CO.	SOUTH PENN OIL CO.	GARTLAND OIL CO.	SOUTH PENN OIL CO.

FROM THE TOP OF THE PITTSBURG COAL TO THE FIFTH SAND

510 FEET FROM SURFACE TO TOP OF PITTSBURG COAL	1084 FEET FROM SURFACE TO TOP OF PITTSBURG COAL	935 FEET FROM SURFACE TO TOP OF PITTSBURG COAL	140 FEET FROM SURFACE TO TOP OF PITTSBURG COAL



OIL GROUP SECTIONS

EXTENDING FROM

MARION CO. TO LEWIS CO. WEST VA.

TO ILLUSTRATE THE STRUCTURAL VARIATIONS FROM THE TOP OF THE PITTSBURG COAL TO THE FIFTH SAND OF THE MARION, WETZEL, HARRISON AND LEWIS CO. OIL SANDS GOING SOUTHWESTERLY.

feet; total depth through Big Injun sand, 1940 feet. Produced 10 barrels of oil first 24 hours. Well finished through Big Injun sand August, 1891. Began to drill well down to Gordon sand in May, 1894. Top of Gordon sand, 2723 feet; oil in Gordon sand, 2727 feet; through Gordon sand, 2742 feet; dark slate to top of fourth sand, 2762 feet; gas in fourth sand, 2780 feet; bottom of fourth sand, 2788 feet; slate, 2800 feet; limestone, shells, 2900 feet; slate, 3000 feet; total depth, 3000 feet. Well drilled 2488 feet below the Pittsburg coal. Produced 80 barrels of oil first 24 hours from the Gordon sand. Well finished August 15, 1894. Contractors Burt Oil Company. Drillers and tool dressers sworn to secrecy before drilling well to Gordon sand.

The first Keener sand oil well was drilled by the Victor Oil and Gas Company on the Widow Jane Keener farm, three miles south of Sistersville, in October, 1892, well began producing 25 barrels of oil a day.

Record of John B. McCoy farm well No. 1, Sistersville; Capt. J. T. Jones, owner.

Ten inch drive pipe, 55 feet; 8¼ casing, 246 feet; 6¼ casing, 1000 feet; top of Big Injun sand 1360 feet; oil pay in Big Injun sand, 1384 to 1401 feet; total depth, 1434 feet. Produced 1200 barrels of oil the first month. Producing 14 barrels of oil a day at present. Well finished May 25, 1892. W. L. Armstrong, Superintendent.

Record of David McGregor heirs farm well No. 1, Cairo; A. C. Hawkins and Company, owners.

Conductor, 16 feet; 10 inch casing 178 feet; 8¼ casing, 800 feet; 6¼ casing, 1204 feet; top of the salt sand, 1481 feet; gas and oil, 1486 feet; bottom of the salt sand, 1509 feet; top of the Big Injun sand, 1617 feet; break in Big Injun sand, 1621 to 1626 feet; gas and oil, 1631 feet; gas, 1648 feet; finished well at 1652 feet; drilled in the salt sand June, 1896, and produced 20 barrels of oil each 24 hours. Well drilled down to the Big Injun sand April, 1897. Produced 25 barrels of oil from the Big Injun sand each 24 hours. John Cain, contractor.

Record of William Farrell farm well No. 4, Elk Fork, Tyler county; Treet and Crawford, owners.

Conductor, 16 feet; coal, 310 feet; Cow run sand, 964 feet; 8¼ casing, 964 feet; 6⅝ casing, 1590 feet; top of Big Lime, 1590 feet; top of Keener sand, 1787 feet; total depth, 1810 feet. Production 200 barrels of oil first 24 hours. McCutcheon Bros., contractors.

Record of Mason Bros.' farm well No. 1, Jug, Tyler county; Treet and Crawford Company.

Conductor, 50 feet; 10 inch casing, 375 feet; 8¼ casing, 862 feet; Cow run sand, 775 feet; bottom of Cow run sand, 787 feet; top of Maxin sand, 1542 feet; bottom of Maxin sand, 1561 feet; well finished September, 1899. Production first 24 hours, 30 barrels of oil. Drillers, Charles Ramsey and Grant Lee. Tool dressers, John Sayre and Ed Webber. McCutcheon Brothers, contractors.

Record of the largest well ever struck in West Virginia; M. Copley heirs farm well No. 1, Sand Fork, Lewis county; South Penn Oil Company, owners.

Well drilled in the Gordon sand Saturday, September 22, 1900. Produced 6,000 barrels of oil first 24 hours. Contractors, Black Bros.

Record of a salt sand well in Calhoun county; Other Oil Company; Ellen Betts farm well No. 1, located on Pine Bottom at the mouth of Nigh Cut run on Little Kanawha river, three miles west of Grantsville, county seat of Calhoun county.

Began drilling May, 1902; oil in salt sand, 1330 feet; finished well July, 1902. Production first 24 hours, eight barrels.

Record of the deepest producing oil well in the world; Genine Robinson farm well No. 17, situated in Folsom district, in the southeastern part of Wetzel county; South Penn Oil Company, owners.

Began drilling June 24, 1902; 13 inch conductor, 16 feet; 10 inch casing, 1005 feet; 8¼ casing, 1952 feet; 6⅝ casing, 2763 feet; 5 3-16 casing, 2873 feet; total length of casing, 8609 feet; Pittsburg coal, top, 1428, bottom 1435 feet; Dunkard sand, top, 1940, bottom, 1995 feet; salt sand, top, 2045, bottom, 2250 feet; Little Lime, top, 2640, bottom, 2650 feet; Pencil cave, top, 2650, bottom, 2655; Big Lime, top, 2665, bottom, 2730; Big Injun sand, top, 2730, bottom, 2835 feet; fifty foot sand, top, 3350, bottom, 3385 feet; red rock, top, 3405, bottom, 3640 feet; stray sand, top, 3500, bottom, 3520 feet; oil in stray sand, 3505 feet; Gordon sand, top, 3531, bottom, 3550 feet. Production first 24 hours, 50 barrels. Total depth, 3555 feet. Well finished September 12, 1902. Contractors, Smith and Burton.

Record of W. Hunter Atha farm well No. 1; Fayette County Gas Company; Farmington.

Conductor, 12 feet; Mapletown coal, 260 to 265 feet; Pittsburg coal, 357 to 366 feet; 10 inch casing, 370 feet; first Dunkard sand, 968 feet; 8¼ casing, 1090 feet; second Dunkard sand, 1090 feet; top of gas sand, 1158 feet; bottom of gas sand, 1200 feet; top of salt sand, 1290 feet; water in salt sand, 1295 feet; bottom of salt sand, 1360 feet; top of Maxin sand, 4178 feet; bottom of Maxin sand, .1492 feet; top of Little Lime, 1618 feet; bottom of Little Lime, 1628 feet; Pencil cave, 1628 to 1634 feet; 6⅝ casing, 1634 feet; top of Big Lime, 1634 feet; break, 1714 feet; top of Big Injun sand, 1718 feet; bottom of Big Injun sand, 1800 feet; Squaw sand, 1830 feet; fifty foot sand, 2235 feet; thirty foot sand, 2373 feet; Gordon sand, 2580 feet; fifth sand, 2730 feet; total depth, 2730 feet. Produced when drilled in, 5,000,000 cubic feet of gas each 24 hours. Finished February 12, 1903. Hatzell and Wilson, contractors.

Record of Edwin Maxwell farm well No. 2; Weston; Weston Gas Company, owners.

Conductor, 20 feet; 10 inch casing, 145 feet; 8¼ casing, 705 feet; Big Lime, 1412 feet; small show of oil, 1432 feet; 6⅜ casing, 1440 feet; top of Big Injun sand, 1495 feet; bottom of Big Injun sand, 1575 feet; slate, 1600 feet; sand, 1645 feet; slate and shells, 1800 feet; top of Gantz sand, 1850 feet; gas, 1871 feet; bottom of Gantz sand, 1889 feet; slate, 1909 feet; fifty foot sand, 1924 feet; slate, 1955 feet; thirty foot sand, 1978 feet; red rock, 1994 feet; stray sand, 2068 feet; slate, 2070 feet; top of Gordon sand, 2072 feet; bottom of Gordon sand, 2102 feet; lime, 2130 feet; sand, 2140 feet; slate, 2170 feet; top of fifth sand, 2254 feet; gas in fifth sand, 2255 feet; bottom of fifth sand, 2272 feet; total depth, 2272 feet; volume of gas, 3,000,000 cubic feet each 24 hours. Well finished March 18, 1903. Hatzell and Wilson, contractors.

Record of well No. 1, W. H. H. Wheaton farm, Burning Springs, Wirt county; Henning and Ewing, owners.

Sruck oil in the 500 foot sand, 450 feet deep. Production first 24 hours, five barrels of oil. Well drilled May, 1903.

OHIO WELL RECORDS.

Record of the first well drilled in Ohio, on Duck creek, between Caldwell and Dudley, Noble county.

The first well was drilled by Thomas Thorley in 1814 for salt water brine. Oil and gas were found at 75 feet. The well was abandoned, as the devil's grease, as the oil was then called, spoiled the salt brine.

Record of the first well drilled in Ohio from which the oil was sold, at Dudley, Noble county, in the summer of 1841.

Robert McKee began drilling on the bank of Duck creek for salt water brine; at the depth of 475 feet oil was struck. The well produced about 20 gallons a day. The product was called devil's oil, and had very little sale until 1846, when it was put on the market and sold by Bosworth, Wells & Co., of Marietta, Ohio, for medicinal purposes.

Record of the first well drilled in the first Cow run sand in Ohio.

On the second day of February, 1861, leases were taken from Samuel and Uriah S. Dye by a company composed of John Newton, Douglass E. Newton, William Naylor, Moffat Dye and George S. Bosworth for 140 acres of land on Cow run, in Lawrence township, Washington county. The first well was located near a natural gas spring on the U. S. Dye farm. It was drilled by spring pole. A very small show of oil was found in the first Cow run sand at 150 feet. The well was drilled 200 feet and abandoned as a dry hole in July, 1861.

Record of the first oil well drilled in the first Cow run sand, Cow Run, Lawrence county.

John Newton, Douglass E. Newton, William Naylor, Moffatt Dye and George S. Bosworth, owners; Samuel Dye farm well No. 1. Began drilling with spring pole August, 1861; struck oil in first Cow run sand 150 feet deep in December, 1861. The well produced 50 barrels of oil a day when first struck and was named the Old Cow and is the first well which produced oil from what is known as the first Cow run sand of Ohio and West Virginia.

Record of the first well drilled in Ohio expressly for oil.

The well was drilled by James Dutton, Alden T. Warren and John Smithson on a lease given by William Bayley on August 18, 1860, for a strip of land two rods wide and 10 rods long fronting on Duck creek, one-half mile southeast of Macksburg, Aurelius township, Washington county. The term of the lease was for 99 years; the consideration was $1, to be paid at the end of 10 years. Search was to be made for rock oil and if none were found the land was to revert to the owner and no money was to be paid. At 60 feet lubricating oil was struck. The spring pole system was used in drilling. The well was finished in December, 1860, and produced 25 barrels of lubricating oil a day. It was pumped by hand and the old fashioned wooden pump was used. The oil was taken by wagon to Lowell on the Muskingum river and shipped by boat to Pittsburg. The gravity was 28 degrees Beaume, and sold at one time for $28 dollars a barrel

Record of the first oil well drilled in northwestern Ohio; Ben A. Faurot paper mill lot well No. 1; Lima, Allen county.

Began drilling well for gas January, 1885. Drive pipe 30 feet; 5⅝ casing, 375 feet; top of Trenton rock, 1300 feet; small show of gas and oil, 1310 feet; total depth, 1350 feet. Well was shot and put to pumping May 9, 1885. Production first 24 hours, 10 barrels of oil.

Record of the first flowing oil well drilled in the Lima oil field; Underwood town lot; J. L. Apple well No. 1; Lima, Allen county.

Began drilling April, 1886; drive pipe, 18 feet; 5⅝ casing, 370 feet; top of Trenton rock sand, 1304 feet; first gas, 1305 feet; first show of oil, filled up 100 feet in hole, 1316 feet; oil filled up 1000 feet in hole at 1321 feet; well started flowing at 1322 feet; total depth, 1322 feet. Production first 24 hours, 175 barrels of oil. Well completed May 3, 1886. Record by J. L. Apple, owner.

Record of the first well that produced oil that was run in the pipe line and sold in the Sistersville, W. Va., oil field; F. and C. Russell farm well No. 1, near Millers run, Monroe county, Ohio, 1½ miles north of Sistersville; Captain J. T. Jones, owner; W. L. Armstrong, superintendent.

Ten inch casing, 36 feet; 8¼ casing, 370 feet; salt sand, 640 feet; 6¼ casing, 772 feet; top of Big Injun sand, 1389 feet; total depth, 1440 feet. Finished

August 21, 1891. Production first 24 hours, 25 barrels. E. A. Myers, contractor.

Record of James Scott farm well No. 1, Scio oil field; Le Comte Bruner, Stewart & Co.

Conductor, 16 feet; 8¼ casing, 250 feet; 6¼ casing, 895 feet; top of Berea grit sand, 1268 feet; oil pay in Berea grit, 1284 feet; bottom of Berea grit, 1291 feet; total depth, 1291 feet. Well finished in February, 1899. Production first 24 hours, 40 barrels of oil.

Record of M. J. Millhorn farm well No. 1, Graysville oil field; Bruner, Stewart & Co., owners.

Conductor, 20 feet; 10 inch casing, 103 feet; 8¼ casing, 650 feet; 6¼ casing, 1255 feet; top of Keener sand, 1469 feet; bottom of Keener sand, 1488 feet; total depth, 1491 feet. Production 50 barrels first 24 hours. Drilled December, 1900.

Record of Asa Cline farm well No. 3; Pure Oil Co.; Jackson ridge oil field, Monroe county.

Conductor, 15 feet; 8¼ casing, 745 feet; 6¼ casing, 1200 feet; top of Keener sand, 1468 feet; pay in Keener sand, 1470 to 1485 feet; total depth, 1515 feet; production first 24 hours, five barrels of oil. Record by J. W. Chrispen, driller.

Record of Turkey Foot well; A. W. Gooden farm well No. 1, Knoxville oil field; Cleveland and Port Home Oil Company.

Conductor, 16 feet; coal, 30 to 33 feet; coal, 75 to 79 feet; 8¼ casing, 175 feet; top of Hurry Up sand, 250 feet; bottom of Hurry Up sand, 290 feet; top of salt sand 730 feet; bottom of salt sand, 780 feet; top of Big Injun sand, 900 feet; bottom of Big Injun sand, 955 feet; 6¼ casing, 960 feet; top of Berea grit, 1402 feet; bottom of Berea grit, 1451 feet; total depth, 1451 feet. John Weldron and Sons, contractors. Record by J. W. Chrispen, driller.

Record of Edwin Sharp farm well No. 2; Uniontown oil field; Le Comte Bruner and Co., owners.

Conductor, 16 feet; 10 inch casing, 140 feet; 8¼ casing, 900 feet; 6¼ casing, 1340 feet; top of Berea grit sand, 1683 feet; oil in Berea grit, 1695 feet; bottom of Berea grit, 1708 feet; total depth, 1711 feet; produced first 24 hours, 100 barrels; well drilled in February, 1903.

Record of Corporation well No. 1, Matamoras Oil Co.; New Matamoras.

Ten inch drive pipe, 44 feet; 8¼ casing, 200 feet; first Cow run sand, 485 to 493 feet; coal, 512 to 522 feet; second Cow run sand, 555 to 579 feet; gas sand, 755 to 805 feet; coal, 830 to 834 feet; first salt sand, 902 to 952 feet; 6¼ casing, 960 feet; coal, 980 to 987 feet; second salt sand, 1072 feet; gas, 1080 feet; fine show of oil, 1085 to 1090 feet; gray sugar sand, 1164 to 1182 feet; Big lime, 1268 feet; show of oil and gas, 1284 to 1289 feet; Big lime sand, 1289 to 1318 feet; Keener sand, 1318 to 1360 feet; top of Big Injun sand, 1378 feet; Good sand, 1378 to 1383 feet; Hard sand, 1383 to 1388 feet; break of slate, 1386 to 1424 feet; second streak of Big Injun sand, 1424 to 1444 feet; black slate, 1444 to 1450 feet; total depth when abandoned, 1450 feet; drilled March, 1903. James A. Kennedy, contractor.

OIL WELL SUPPLY CO.

ESTABLISHED 1861

Manufacturers of Machinery and Supplies of all Descriptions for Oil Country Operations.

The "oil country outfit" is a variable term. It is a safe assertion that two could not be found alike in all details. While the general characteristics vary but little, it is the detail which must be considered, and which involves great change in selection and variation in price. Very little of this is due to fancy or other cause than that of necessity. Each outfit must be made up of parts all of which harmonize and work well together and are adapted to the particular conditions under which the outfit is to be used. From this may easily be conceived the inability of naming prices on an "ordinary outfit." They are all ordinary to the manufacturer, but one perfectly adapted to one section of country might be almost useless in another. A few general rules and observations may be given which will be of interest and value. For this purpose we will divide the material composing an outfit in the following manner:

RIG

This refers only to the structure, with its foundation of heavy timbers, and the wheels and reels on which are carried the lines or cables to which are attached the drilling tools proper. We furnish all the irons, nails, bolts and special parts for building the wheels and reels, and can, if desired, give specifications for cutting the timber and lumber, which may be obtained from local sources. The portion which we furnish will cost from $50.00 to $275.00, according to size and design. The weight varies from 15 cwt. to 80 cwt. In cases where timber and lumber cannot be obtained we supply the entire Rig, carefully framed, and ready to erect. Prices vary from $600.00 to $750.00 and average weight equivalent to two ordinary car lots or 60,000 lbs. Shallow wells not exceeding 600 to 800 feet in depth may be drilled through ordinary formations by the use of the Corbett Mast Rig. This Rig, while not as strong or admitting of such rapid work as the standard Rig, is particularly useful for prospecting or for conducting work where transportation facilities are limited and economy more desirable than speed.

MACHINERY

By this we refer to the Boiler and Engine. The former ranges from 15 to 40 H. P., the latter from 12 to 30 H. P. Both are specially adapted to the work, and the Engine in particular is an essential. In fact, it is not practicable to use an ordinary engine for this purpose. Price, Boiler and Engine, from $580.00 to $900.00. Weights, 8,000 to 16,000 lbs.

DRILLING TOOLS

We include under this head all essentials for making the bore and cleaning out the detritus, also all special appliances for removing tools which may be broken or otherwise fastened in the bore; also Cable and Sand Line, and tools for handling Casing and Pipe used in the construction of the well. This is the portion of the outfit which must be selected with the greatest care, and with an eye to its efficiency in meeting the peculiar conditions for which it is intended. It is quite impossible to give other than the widest range, and while some of the simplest and lightest outfits might be used to advantage at a cost of $500, other conditions might require the expenditure of $4,000 to $5,000.

TUBULAR GOODS

Every well requires some casing or piping in its construction. In some wells a single column of casing to shut off the water is sufficient, in others several such are needed, each column being of a size to pass through the preceding column with the least possible lost space between the two. Frequently it is necessary to drive the columns of pipe instead of inserting them after the bore is prepared to receive them. In that case heavy pipe, called drive pipe, must be used. In drilling a well in a district where the geological formation is not well known it is much safer to use drive pipe. The ordinary sizes are 10, 8, 6 and 4½ inches inside diameter. No one can tell how much of each size might be required until the initial well is completed. In the different districts of the oil regions the correct amounts can be quite accurately determined, as well as the sizes and kinds which can be most economically used. The foregoing observations apply to all operations conducted where the formations are composed largely of rock of varying degrees of hardness. The recent developments in Texas disclose a formation nearly devoid of rock, the formation from surface to oil-bearing stratum being a series of strata of clay and quicksand. To successfully cope with this unusual condition a quite different system is necessary, known as the

ROTARY HYDRAULIC OUTFIT

This includes Boiler and Engine for power, heavy Steam Pump for the hydraulic pressure, special Hoisting Gear, Rotary Table for turning and lowering the pipe, and special appliances for connecting and operating the outfit. Such an outfit costs about $3,000. The contractors having the most experience use two Boilers and two Pumps to provide against the danger of sticking the pipe by stopping for repairs. This would increase the cost about $650.00. The Rig used is a simple Derrick, which can be built by any ordinary carpenter. The same rules pertaining to the regular outfit for casing and pipe will apply in the use of the Rotary Hydraulic.

COMBINATION RIG AND OUTFIT

The Combination Rig, as its name implies, embodies the principles of both the Standard Cable Rig and the Hydraulic Rotary Rig. This involves a higher cost and greater weight. A complete outfit, not including the Tubular goods or the timber and lumber for derrick, costs about $5,000, and will weigh approximately 470 cwt.

PORTABLE DRILLING MACHINES

It has been shown that great power and strength are required in performing the ordinary functions of a drilling rig. This implies a corresponding weight, or the very antithesis of mobility. The obvious advantages of a Rig which may be freely moved about are such that many attempts have been made to produce one of sufficient power to compete with the Standard Rig. These efforts have usually resulted in disappointment. The exceptions are so rare that experienced drillers are justified in questioning any broad claims, but we are now prepared to offer portable Machines which will do all that we claim for them. These are built in various sizes for depths ranging from 150 feet to 2,500 feet.

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